

**Table D-1 (continued)**  
**10 Year Timber Program**

Sale Name	District MA#	Sale Area (Acres)	Forest Type	Sale Volume (MMBF)	Road Construction	Road Reconstruction	Loggmg Method	Harvest Method
<b>Fiscal Year 1993</b>								
Kimshew	AL/47	600	MC	3.5	5.0	12.0	T, H	CC
Cold Steel	AL/45	1,300	MC	8.0	3.8	5	T	OR, SW, CC
Carbou	AL/22	1,000	Fir	5.0	2.0	1.0	T	SW, Int, CC
Delcar	AL/36	800	MC	5.5	2.7	1.4	T, C	SW, CC, OR, Int
Horse Heaven	HC/9	800	MC	4.0	1.3	4.1	T	Int, CC
Battle Bash	HC/16	1,000	Pine	4.0			T	OR, CC
Simply Red	HC/16	800	MC	3.0			T	Int, CC
Prospect	HC/17	1,000	MC	4.0		2.4	T	CC, SW
Harvey	ELI17	1,200	Pine	6.0		1.5	T	OR, Int, CC
Hog-MA	EL/25	400	Pine	2.0			T	OR, Int, CC
Grays	ELI18	800	MC	5.0			T	OR, CC, SW, Int
Small Log	All	7,000	MC, Pine	20.0			T	Int
Salvage	All			8.0			T	Salvage
Misc	All			1.0				
Total				85	14.8	22.9		

**Table D-1 (continued)**  
**10 Year Timber Program**

Sale Name	District MA#	Sale Area (Acres)	Forest Type	Sale Volume (MMBF)	Road Construction	Road Reconstruction	Logging Method	Harvest Method
<b>Fiscal Year 1994</b>								
Pinnacle	AL/37	600	MC	80	70	4	T, C	Int, OR, SW
Lost Lake	AL/37	2,000	MC	150		5	T	OR, Int, SW, CC
Mud Hole	AW44	1,400	MC	100		5	T	OR, s w, Int, CC
Summit	AL/44	1,500	MC	80	20	20	T	Int, SW, OR, CC
Rake	HC/17	1,000	Pine	40			T	Int, CC
Jack	HC/6	800	Pine	40			T	Int, CC
Wilcox II	HCIS	1,000	MC	2.5			T	Int, CC
Refugee	HCIS	800	Pine	40			T	Int, CC
Shakedown	HC/1	700	MC	5.5			T	Int, CC
Lost Rock	HC/17	1,500	MC	40			T	GS
North Crater	EL/19	3,000	Pine	80	10	3	T	Int, OR, c c, SW
Interior	EL/21	600	MC	80	7	3	T	OR, Int, SW, CC
Indicator	EL/31	600	MC	10	20	6	T	OR, CC
Blacks 6	EL/11	350	Pine	40	15		T	Int
Small Log	All	5,000	MC, Pine	120				Int
Salvage	All		All	70				Salvage
Misc.	All			50				
Total				1100	142	46		

**Table D-1 (continued)**  
**10 Year Timber Program**

Sale Name	District MA#	Sale Area (Acres)	Forest Type	Sale Volume (MMBF)	Road Construchon	Road Reconstruction	Logging Method	Harvest Method
<i>Fiscal Year 1995</i>								
Alder	AL/41	1,200	MC	88	<b>2</b>	3	T	Int, CC
Shanghai	AL/87	2,000	MC	140			T	CC, Itm, SW
Discovery	AL/46	1,800	MC	100			T, C	OR, Int, SW, CC
Narrows	AL/42	800	MC	90	30	70	T	Int, CC, OR, SW
Vision	AL/38	2,000	MC	<b>50</b>			T	SW, OR, Int, CC
Jacks Back	HC/16	<b>1,200</b>	Fir	30			T	Int, CC
Soldier	HC/2	1,200	MC	<b>5.0</b>			T	Int, CC
<b>Cornaz</b>	HC/9	1,700	Fine	<b>3.0</b>		<b>1.0</b>	T	Int, CC
Corner	HC/8	<b>900</b>	Pine	30		<b>1.0</b>	T	Int, CC
<b>Astarte</b>	HC/9	<b>400</b>	MC	5.0			T	SW, CC, Int
<b>Latour</b>	HC/26	<b>800</b>	MC	<b>3.0</b>			T	<b>Jit, SW, CC</b>
Baxter	EL/33	1,500	MC	4.0	3.0	1.5	T	OR, SW, Int, CC
Ebey	EL/11	1,200	Plne	4.0			T	OR, Int, CC
Penitentiary	EL/19	1,200	Plne	4.0			T	Int, CC, OR
Sheepshead	EL/7	800	Plne	2.0			T	Int, OR, CC
Cave	EL/14	2,000	Pine	4.0	<b>4</b>		T	Int, OR
Small Log	All		MC, Pine	<b>9.0</b>			T	Int
Salvage	All			<b>6.0</b>				Salvage
<b>Misc.</b>				5.0				
Total				1068	6.6	10.8		

**Table D-1 (continued)**  
**10 Year Timber Program**

Sale Name	Distnct MA#	Sale Area (Acres)	Forest Type	Sale Volume (MMBF)	Road Construction	Road Reconstruction	Logging Method	Harvest Method
<b>Fiscal Year 1996</b>								
Soda	Aw45	2,000	MC	100	8 0	3 0	T, C, H	SW, CC, ITM
Willow	AL/28	2,000	MC	150		3 0	T, C	SW, Int, CC
Turner	AL/35	2,000	MC	150	2 0		T, C	SW, Int
Balderdash	HC/5	800	pine	20		.6	T	Int, CC
Valkyrne	HC/9	1,500	MC	50			T	Int, SW
Bear Wallow	HC/9	1,000	MC	50	5		T	CC, OR
Superbowl II	HC/16	1,500	Fir	7.0	2 0	1 0	T	SW
Castor	HC/5	1,000	Pine	4.0		1 0	T	OR, CC, Int
Ashurst	EL/13	1,500	MC	4 0			T	Int, OR, CC
Keddie	EL/39	1,500	MC	4 0	4 9	10 a	T, C	SW
Campbell	EL/23	2,000	MC	6.0		1 0	T	SW, OR, CC
Willard	EL/32	2,000	Pine	5.0			T	Int, Regen
small Log	All	4,500	All	9.0			T	Int
Salvage	All	Forest	All	10.0			T	Salvage
Misc	All			2.0				
Total				1030	174	20 4		
<b>Fiscal Year 1997</b>								
To Be Announced	All			95 0				
<b>Fiscal Year 1998</b>								
To Be Announced	All			95 0				
<b>Fiscal Year 1999</b>								
To Be Announced	All			95 0				
<b>Fiscal Year 2000</b>								
To Be Announced	All			95 0				
<b>Fiscal Year 2001</b>								
To Be Announced	All			94 0				

# APPENDIX E - MANAGEMENT PRACTICES

## INTRODUCTION

A management practice is a group of related management activities. A set of compatible management practices along with a set of associated standards and guidelines forms a prescription. A prescription, modified as necessary by Management Area Direction, directs management of a specific portion of a Management Area.

Flexibility built into each management practice allows the manager to consider an area's specific needs as expressed in the Management Area Descriptions and Direction. For example, the "Full Timber Management" practice would allow 40-acre clearcuts with straight-line edges. However, based on the resources that are emphasized within the Management Area, the District Ranger can determine the appropriate size and shape of these clearcuts or request authorization to increase their size.

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# DEFINITIONS OF MANAGEMENT PRACTICES

## 1. FACILITIES

### *Facility Construction/Reconstruction* (Roads, Trails, Bridges, Dams, Buildings, etc.)

This practice includes engineering and actual construction or reconstruction. Engineering tasks include planning (needs assessment, area reconnaissance, and site analysis), preconstruction engineering (site surveys, design, cost estimates, and contract preparation), and construction engineering (control staking, contract compliance checking, documentation, and preparation of operation and maintenance plans).

Road construction tasks are as follows. In the vegetation removal phase, trees are felled, bucked, and limbed; logs are skidded out and hauled away, material suitable for firewood may be stacked for later removal by wood-gatherers, slash is scattered, burned or buned; and stumps are scattered or removed to burn or to bury. In the earthwork phase, material is excavated from cut sections and placed in fills. The material is compacted into a stable road bed. Drainage channels are dug, which includes installation of pipes or shaping of the road surface to drain water without damage to the road. In the surfacing phase, material is applied to more effectively stabilize the road surface commensurate with estimated traffic flows. Surface erosion control and safety devices are installed as necessary to protect the environment and the public.

### *Road Maintenance*

This practice includes engineering and actual road maintenance. Engineering tasks include safety and condition inspections, establishment of priority, and preconstruction and construction engineering (see previous practice for examples).

Road maintenance involves (1) vegetation removal, including removal of blown-down trees or limbs, and trimming brush or limbs encroaching on the travelled way or screening oncoming traffic; (2) drainage restoration, including removal of sediment from ditches, pipes, or drainage

channels; (3) surface repair, including patching of holes, removal of rockfalls, or slides, and replacement of lost or worn out material, and (4) safety renewal, including repair or replacement of signs, center and edge striping, and litter cleanup.

### *Road Closure*

This practice includes engineering and actual road closure. Seasonal closures may be applied to reduce conflicts with wildlife or roadbed damage during wet weather. Engineering may be needed to determine adequate safety and environmental protection measures. Closure tasks include installation of appropriate closure devices, signing, posting of legal notices, subsequent periodic inspection, and ongoing maintenance of the closure device and drainage systems.

### *Road Obliteration*

This practice includes engineering tasks and actual road obliteration. Engineering may be needed to insure that adequate environmental safeguards are included.

Obliteration tasks include removing traffic control devices, signs, pipes, and other related structures, reshaping the roadbed to prevent erosion; re-establishing near-natural contours to the extent feasible, scarifying compacted areas to encourage natural revegetation, revegetating (if needed) using native species as based on an interdisciplinary team analysis; and periodic inspecting for drainage systems failure.

## 2. FIRE AND FUELS

### *Fuels Management*

This practice consists of inventorying and treating slash, brush, grass, and other flammable material to protect or enhance forest resources and provide for the safety of forest users from wildfire. Fuels include (1) activity fuels from both current and prior operations such as timber harvesting, pre-commercial thinning, and road construction, and (2) natural fuels, such as live and dead materials that have accumulated naturally over time.

Treatment may be accomplished through (1) prescribed fire, such as broadcast burning, machine piling and burning, hand-piling and burning, (2) rearrangement, such as crushing, chipping, piling, and disking, or (3) removal, such as yarding unmerchantable material (YUM), conducting salvage sales, encouraging personal-use firewood removal or commercial biomass removal, and grazing

### ***Fire Management***

This practice involves prevention, presuppression, and suppression of wildfires. This includes fire management planning and analysis, fire prevention, fire detection, coordination of primary and secondary initial attack forces and reinforcements, and the management of support facilities and services.

Prescribed fire from unplanned ignition is managed by the fire management organization. This includes fires that are burning in conformance with pre-established conditions and are meeting land and resource management objectives, but which were not intentionally ignited by resource managers. Ignition will be limited to natural sources (i.e. lightning). Cold trailing, natural barriers, and water are used in preference to handline construction in special areas, Wilderness, and other sensitive areas.

## **3. FISH**

### ***Fish Habitat Management***

This management practice includes (1) installing in-stream structures (boulders, gabions, boulder and log weirs, log and crib deflectors) to modify channel morphology and increase suitable fish habitat, (2) fencing streamside areas and planting riparian vegetation to control livestock grazing to increase streambank cover and canopy over the stream, (3) removing fine sediments from spawning gravels, particularly for anadromous fish species, (4) modifying or removing barriers to migrating spawning fish. Activities in lake environments include planting or protecting riparian vegetation to minimize sedimentation, modifying human access, dredging or changing water levels to increase suitable living space, and placing cover structures for fish.

## **4. MINERALS AND GEOLOGY**

### ***Minerals Management***

This practice describes mineral extraction conducted by a mining claimant or lease holder. Forest Service officials monitor the mining activity to insure protection of the surface resources.

a. **Surface Placer mining and open-pit mining** are the standard methods for extracting shallow-depth ores. Placer mining involves the washing of alluvium containing such minerals as gold, silver, tin, and tungsten. Open pit mining normally is used for lower grade ores such as limestone, pumice stone, asbestos, and diatomaceous earth, but is increasingly being used for precious metals. A waste site and access road are normally involved.

Major disturbance of the ground surface occurs with either of these two methods and in general encompasses between 2 and 20 acres.

b. **Subsurface**. Either vertical shafts or horizontal adits are the standard method for reaching deep deposits. A mine plant, waste site, and access road are normally involved.

c. **Geothermal Development**. The first phase in geothermal development is exploratory drilling, including road, drill pad, and sump construction. Roads are designed to carry heavy loads year-round. The drill pad is an area leveled and cleared of vegetation. The sump is designed to contain fluids. The drill pad and sump require an area of one to three acres.

The second phase includes development of at least a powerhouse, including turbines and generators, and a power transmission line. The type of pipeline and the need for cooling towers depend on the nature of the resource, whether the system is vapor- or fluid-dominated.

The third phase is production, in which electricity or heat is produced and the above facilities are maintained.

d. **Oil and Gas Development**. The exploration phase is similar to geothermal exploration. The development phase involves drilling additional wells and constructing holding tanks and

related facilities. The production phase involves further development, and construction of pipelines to transport the product. Natural gas is exported through a pipeline, usually smaller than 12 inches diameter, which is buried wherever feasible. The production phase requires less maintenance than does geothermal. If oil is the product, it is usually transported in trucks from wellhead holding tanks.

**e. Mineral Materials Development** This includes development and use of cinder pits and gravel pits for both Forest Service and others' use. Requirements are similar to those for open pit mining.

## 5. RANGE

### *Range Administration and Management*

This practice includes administration of grazing permits, maintenance, updating, and implementation of Allotment Management Plans, and coordination of range management activities with other resource uses. This involves checking compliance with grazing permits; preparing and implementing annual operating plans for each allotment, determining range readiness, utilization, condition, and trend, analyzing cost-effectiveness of range improvements, resolving conflicts of range use with other resource use, preventing and terminating unauthorized livestock use; and revising and implementing the five-year range improvement plan.

### *Range Structural Improvements and Maintenance*

This practice includes maintenance and construction of structural range improvements to implement and improve grazing systems, and control livestock distribution to obtain proper forage utilization. Structural improvements include fencing, stockpounds and windmills.

### *Range Non-Structural Improvements*

This practice includes provision of nonstructural range improvements for erosion control or forage production. Non-structural improvements include prescribed burning, plowing and disking of less desirable vegetation species, and drilling or broadcast seeding of grass on disturbed sites.

## 6. RECREATION

### *Interpretive Facilities and Services*

This practice includes planning, design, construction, administration, and rehabilitation of trails, exhibits, unstaffed information stations, amphitheaters, vista points, and other interpretive facilities. It also includes the provision of interpretive services such as campfire programs, guided walks, publications, outdoor education, and community programs.

Operation and maintenance of interpretive services is at one of two levels:

- 1 Standard Service (meeting established standards)
- 2 Limited Service (below established standards)

All interpretive services and facilities are compatible with the ROS class designation (defined in Appendix I) and expected use.

Interpretive facilities and services vary by prescription:

- 1 Developed Recreation Prescription: Unstaffed facilities and interpretive programs
- 2 SPNM Prescription: Trailhead information and education
- 3 SPM Prescription: Trailhead information and education.
- 4 View/Timber Prescription: Unstaffed information stations at vista points
- 5 Special Area Prescription: Interpretive facilities and services compatible with the purpose of the special area designation.
- 6 Wilderness Prescription: Trailhead information and education

### *Restricted Off-Highway Vehicle Use*

This practice involves control of off-highway vehicle use. Use can be seasonally prohibited or restricted to designated routes.



## 7. SOIL, WATER, AND RIPARIAN AREAS

### *Watershed Restoration and Improvement*

Practices that protect water quality and soil productivity are called “Best Management Practices” (BMP’s), and can be divided into three types – preventive, controlling, and corrective. Presently 99 documented practices are approved by the State as BMP’s in Region 5. Several others are being developed. All BMP’s are hereby incorporated by reference into this section of the Plan. Typical examples of each type follow.

#### **a. Preventive Best Management Practices**

These BMP’s are used to avoid soil and water quality problems. Proper use of “preventive” BMP’s minimizes the need for “controlling” and “corrective” BMP’s.

- 1 1 Timber Sale Planning Process
- 1 3 Use of Erosion Hazard Ratings for Timber Harvest Unit Design
- 1 4 Use of Sale Area Maps for Designating Water Quality Protection Needs
- 1.7 Prescribing the Size and Shape of Clearcuts
- 5.2 Slope Limitations for Tractor Operation
- 5 3 Tractor Operation Excluded from Wetlands and Meadows
- 5 6 Soil Moisture Limitations for Tractor Operation
- 6 3 Protection of Water Quality from Prescribed Burning Effects
- 7 7 Management by Closure to Use
- 7 8 Cumulative Off-Site Watershed Effects Analysis (CWE) (Pending State approval)

#### **b. Controlling Best Management Practices**

“Controlling” BMP’s are used to select suitable project alternatives and develop mitigation measures.

- 1.5 Limiting the Operating Period of Timber Sale Activities
- 1 11 Suspended Log Yarding in Timber Harvesting
- 1 13 Erosion Prevention and Control Measures During Timber Sale Operations
- 2 3 Timing of Construction Activities
- 2.7 Control of Road Drainage

- 8 2 Controlling Livestock Numbers and Season of Use

#### **c. Corrective Best Management Practices**

“Corrective” BMP’s are used to improve damaged watersheds.

- 1 1 Revegetation of Areas Disturbed by Harvest Activities
- 2 26 Obliteration of Temporary Roads
- 2 27 Restoration of Borrow Pits and Quarries
- 5 4 Revegetation of Surface Disturbed Areas
- 6 5 Repair or Stabilization of Fire Suppression-Related Watershed Damage.
- 7 1 Watershed Restoration, including (1) building checkdams, gully plugs, and headcut-stabilizing structures, (2) contour furrowing disturbed areas, (3) constructing snow fences, dams, barriers, and gates; (4) obliterating roads, (5) stabilizing road slope by blowing straw, compacting straw, laying jute matting, or wattling, spraying with tackifier or glue, riprapping, paving, or rock surfacing; (6) stabilizing banks by building walls and diversion dams, facing with cribbing or piling, and planting with stabilizing vegetation such as willows, wildlife browse, grass, or conifer seedlings; (7) excluding from livestock grazing or human use by blocking, barricading, or gating, (8) stabilizing landslides; and (9) firming and reshaping wet areas.

## 8. TIMBER

### *Full Timber Management*

This practice includes use of the full range of silvicultural practices to achieve a high timber output from lands classified as suitable for full timber management. It involves the following management prescriptions:

#### **a. Even-Aged Harvest Methods**

*Clearcut* - This is the removal of all, or nearly all, merchantable trees in a stand so that a new stand may be established. Type of clearcut may be group, stand, or strip. Harvest units range from approximately 2 to 40 acres, but average 15 to 25 acres.

**Seed-Step Shelterwood Cut** - This is the removal of all merchantable trees except desired overstory trees. On the Forest, regeneration is usually accomplished by planting.

**Overstory Removal** - This is the removal of the trees that have been left to regenerate a new stand naturally or to protect planted trees. Minimum stand size is five acres. This treatment usually is made in the decade following the seed-step harvest.

**b. Uneven-Aged Harvest Methods**

**Group Selection** - This is the removal of all merchantable trees from groups no larger than two acres. All of the cultural practices listed below may be applied to these groups.

**Individual Tree Selection** - This is the removal of individual trees of all size classes within the area being managed under this system. The intent is to maintain a specific ratio of number of trees between the different size classes. Ideally, natural regeneration is relied upon for restocking. Precommercial thinning is normally the only cultural treatment applied.

**c. Intermediate Harvest Methods**

**Intermediate harvests** - may be made between the time a stand reaches merchantable size and final harvest. This includes commercial thinning, sanitation or high-risk cutting, and salvage. Yield is part of the allowable sale quantity. Fuel treatment usually follows an intermediate harvest.

**d. Cultural Practices**

Activities following harvest are called “cultural practices” and may include site preparation, artificial or natural regeneration, vegetative management, precommercial thinning, and animal control:

(1) Site Preparation

**Bulldozing** - Removal of vegetation and debris following logging so as to expose mineral soil for planting or natural regeneration.

**Mastication** - Treatment by machines that mow or masticate vegetation and debris to allow access to the ground for planting. This must be followed by hand-scalping spots at the time of plant-

ing. It is not appropriate alone for natural regeneration.

**Burning** - Spot or broadcast burning to remove vegetation and debris to expose mineral soil for planting or natural regeneration. Exposure of mineral soil is not necessary for planting if spots will be hand scalped.

**Hand Preparation** - Hand removal of vegetation and debris to allow access for planting. This is not appropriate for natural regeneration.

(2) Planting Practices

**Pine Species and Mixed Conifers** - Planting of an average of 400 trees per acre (10' x 10' or 8' x 12' spacing) with species adapted to the site. Stocking levels must meet R-5 minimum standards at the end of the fifth year.

**Douglas-Fir and True Firs** - Planting of 600 trees per acre (average 8' x 8' spacing) with species adapted to the site. Stocking must meet R-5 minimum standards at the end of the fifth year.

**Natural Regeneration** - Exposure of mineral soil is necessary. Seed trees remain until stocking meets R-5 minimum standards.

**Seed Collection** - The tree seed inventory should remain sufficient to meet 10 year reforestation needs. Seed collections must meet the Base Level Program described in the Tree Improvement Plan for the California Region, 1976.

(3) Release Practices

**Release** - The objectives of release are (1) to insure establishment of conifer seedlings and (2) to promote acceptable height growth. Conifer release from vegetation competition is necessary when the other vegetation (shrubs, grass, and forbs) has the potential to occupy, or is currently occupying, 30

percent or more of the area or has a crown volume exceeding 10,000 cubic feet per acre

Release may be accomplished by herbicide application or by hand or mechanical cutting. More than one treatment is usually needed.

On about 50 percent of the planted land, two release treatments are planned within five years after planting.

#### (4) Animal Control Practices

The animals most damaging to a regenerated timber stand are deer and pocket gophers. Poisoned bait is used for pocket gophers, and seedling protectors are used for both pocket gophers and deer.

Control measures are needed on regenerated stands in the following estimated amounts: 25 percent of eastside pine, 30 percent of mixed conifer, 100 percent of red fir and lodgepole pine.

#### (5) Precommercial Thinning Practices

This is the removal of trees of less than minimum sawlog size to increase growth rates in the remaining stand. Precommercial thinning is not done unless 20 percent or more of the basal area will be removed. Thinning is accomplished through commercial sale procedures for biomass products when possible.

### **e. Logging Systems**

The Forest uses three general types of logging systems: tractor, cable, and aenal.

Tractor logging is by far the most common system on the Forest. Tracklaying vehicles ("cats") and/or rubber-tired skidders are used to skid the logs, usually downhill to a landing with road access. About 80-90 percent of the Forest is suitable for tractor logging.

Cable logging is the usual method on slopes too steep to be accessible or safe with tractors. Logs

are attached to cables and are skidded, usually uphill to a roaded landing, with one end of the log suspended. About 10-20 percent of the Forest requires cable logging.

The only aenal system used on this Forest has been helicopter. It is seldom used, but may be necessary in isolated areas where harvest volumes are small or where the cost of other logging systems plus road construction would be more expensive.

The need for roads varies significantly by logging system. Since skidding distances are limited to about 1/4 mile, tractor logging requires approximately two to three miles of road per square mile, cable logging requires three to four miles of road per square mile. Helicopter logging requires fewer roads than the other two logging systems.

### **f. Rotation Length**

Minimum rotation length is the culmination of mean annual increment of a regenerated stand. Rotations vary from about 120 to 150 years depending on major forest type, site, and management intensity.

Minimum rotation length is a modeling constraint used to generate forest-wide outputs based on Forest averages. In actual practice, a site specific silviculture prescription may determine that regenerating a stand before the minimum rotation age (used in the model) is warranted.

### **Modified Timber Management**

This practice is appropriate for managing timber on land where needs other than timber production, such as enhancement of visual quality or wildlife habitat are emphasized.

A full range of silvicultural practices is appropriate, although harvest areas are usually smaller than in Full Timber management and are designed to meet other resource objectives. All of the harvest methods listed under Full Timber Management can be used. Harvest areas are typically from one to 20 acres.

Cultural activities are the same as for Full Timber Management.

Logging systems and amount of road construction depend on the particular need for which this practice is applied

### ***Limited Timber Management***

Areas where this practice applies include (1) sensitive visual zones, (2) riparian zones, (3) goshawk habitat areas, (4) old growth retention areas, and (5) extremely rocky forest lands. This practice may also be applied under certain circumstances to areas where normal harvesting would not be scheduled, such as semi-primitive motorized recreation areas

It involves the use of the uneven-aged harvest methods listed under Full Timber Management as well as individual tree harvest by salvage and high-risk sanitation. Regeneration harvests are not foreseen, but reforestation may be appropriate in some situations

Tractor logging is most common. Harvesting is generally done on land that already has access, so road construction is usually unnecessary

## **9. VISUAL RESOURCES**

### ***Visual Resource Management (VRM)***

This practice involves application of design principles to the Forest landscape to minimize visual impact of any management activity and thus maintain the highest quality scenery possible. This is accomplished by modifying timber management practices such as clearcut size and shape, slash disposal, silvicultural prescriptions, harvest methods, and road locations. Visual resource management also includes the location and design of trails, roads, and structures and the revegetation or other rehabilitation of visually unacceptable sites

Visual resource management actions vary with the severity of the activity and are guided by Visual Quality Objectives (VQO's) which are specified for all areas of the Forest. VQO's describe the maximum acceptable visual change to the landscape due to management activities in terms of observer perception. Visual Quality Objectives define a minimum level of visual quality which Forest managers exceed where possible. Visual Quality Objectives are specified in

the prescriptions and in the Management Area Direction. Definitions of each VQO are in Appendix N

## **10. WILDLIFE**

Practices for fish and wildlife are separated into practices for Threatened and Endangered species, harvest species, Management Indicator Species, and special habitats. Species to be given special management emphasis in a given Management Area are identified in the Management Area Direction. Wildlife management emphasis is usually limited to a few species that represent other species that occupy the same vegetation types. Alternatively, management can focus on specific habitats (riparian) or habitat elements (snags). Habitat requirements for wildlife and fish species and descriptions of special habitats or habitat elements are found in the *Northeast Interior Zone Habitat Capability Models* (Shimamoto and Airola 1981), a sample of which is given in Appendix O

### ***Threatened and Endangered Species Habitat Management***

This practice includes all activities necessary for the recovery of Threatened or Endangered species. It applies to all presently occupied areas and potential habitat that is necessary to meet species' recovery goals. Although these practices are for currently listed species, they can be modified to include any species classified as Threatened or Endangered in the future

**a. Bald Eagle** Practices to improve bald eagle habitat are appropriate silvicultural treatments, prescribed burning, area closures, and other structural and non-structural habitat improvements that maintain or enhance nesting, perching, and foraging habitat. Areas may be closed between the onset of nesting and the fledging of young. Practices that improve the eagles' forage base are given high priority

**b. Peregrine Falcons** Appropriate practices are those that reduce disturbance during the nesting season, increase the diversity of prey and increase reproductive success. Wetland development to increase prey in localized areas and nest manipulation are used. Eggs may be removed from nests, incubated artificially, and young

returned to nests to insure successful hatching of pesticide-thinned eggs.

**c. Shasta Crayfish** Protection of cool, constant temperature, moderate flow, spring-fed streams from disturbance and siltation are appropriate actions. Extirpation of non-native crayfish and reintroduction of Shasta crayfish may be appropriate in limited instances.

**d. Northern Spotted Owl** Protection of habitat from disturbance (timber harvest, wildfire, recreation development), special silvicultural treatments for early seral stands, and closure of habitat areas to woodcutting are appropriate practices. One Habitat Conservation Area (HCA) has been identified within the range of the northern spotted owl. The HCA covers 9,548 acres on the Forest.

### ***Harvest Species Habitat Management***

Habitat improvement for harvest species usually requires both capital investment and coordination with other resource uses. Structural and non-structural habitat improvements are made to create habitat configurations with the location, and interconnection of foraging and cover habitat.

**a. Mallard (Waterfowl)** Construction of water impoundments and nesting islands, and coordination with livestock grazing are used to improve waterfowl habitat. Since mallards select nest sites prior to spring vegetation growth, adequate amounts of residual vegetation from the previous year must be maintained.

**b. Gray Squirrel** Silvicultural treatments and prescribed burning are used to perpetuate mature oak/conifer stands and riparian deciduous habitat. Existing and potential den trees, particularly oaks greater than 18 inches in diameter, are protected. Dead and down wood is retained as cover. Some oaks are cut and allowed to sprout to provide a continuous supply over time. Thinning is used to enhance survival and mast production.

**c. Black Bear** Special silvicultural treatments, prescribed burning, and control of vehicular access are necessary to enhance black bear habitat. A mixture of conifer stands, oak and hardwood

types, riparian habitat, and non-forested areas in various stages of seral development is made available. Security habitat, characterized by dense stands of shrub tree cover and freedom from excessive human disturbance is provided. For Management Areas where bears are an emphasis species, 3,000 to 5,000 acre areas are to be managed to provide black bears habitat according to these practices.

**d. Mule Deer** Prescribed burning of shrublands, modified livestock grazing, and modified timber cutting on winter ranges are necessary to provide desirable winter foraging habitat for deer. Modification of reforestation and release activities on fawning areas and summer ranges are normally necessary to insure high quality suitable habitat through time. Area road closures are often appropriate.

Within deer winter ranges to the extent biologically possible, at least 20 percent of the area is managed to provide thermal cover and 20 percent to provide hiding cover. ("Thermal cover" consists of tree or shrub stands at least 10 feet tall with at least 60 percent or greater crown closure.) On summer ranges, a cover to forage ratio between 40:60 and 60:40 is provided (Cover is defined as Wildlife Habitat Relationship seral stages 2B, 2C, 3B, 3C, 4A, 4B, and 5 as described in FEIS Appendix U.) Escape cover is maintained, usually in 20 to 40 acre units, around openings larger than five acres.

Within identified key fawning habitats (meadows, brushfields, and plantations on summer and intermediate ranges), motorized use is minimized between May 1 and June 15. Low shrubs, trees, and downed logs, preferably between two and six feet tall, are maintained for fawning cover in these key areas.

**e. Pronghorn Antelope** The main activities to improve pronghorn antelope habitat are prescribed burning or mechanical treatment of sagebrush, range seeding, modified livestock grazing, and removing barriers to migration (fences). Antelope require non-forested habitats composed of forbs (10-30 percent ground cover), shrubs (5-20 percent ground cover) and grasses (remaining ground cover). Vegetation height should be 5-15 inches. At least one source of water per square mile is desirable.

## ***Other Management Indicator Species and Special Habitat Management***

This management practice includes all habitat improvement activities for special habitat types or Management Indicator Species not mentioned above. This includes Sensitive plant species habitat management which involves all activities necessary for the maintenance, and where applicable, enhancement of Sensitive plant species and their associated habitats. Intensity, frequency, and timing of management activities to maintain or enhance Sensitive plant species is outlined in individual species management guides. Animal species include osprey, pileated woodpecker, hairy woodpecker, and marten. Improvement actions are normally limited to minor structural habitat improvements, but include increased retention of snags, dead and down wood, and riparian or hardwood vegetation. Some specific requirements for the following species include

- a. **Osprey** Within osprey nest areas, unauthorized motorized use is prohibited during the nesting season - approximately March 15 to August 15. Within existing and potential osprey nesting areas, future nest trees are designated or recruited. Nesting platforms are constructed and maintained as needed.
- b. **Pileated Woodpecker** Where it is an emphasis species, approximately one pair of pileated woodpeckers per square mile of potential habitat

is desired. Groups of at least ten trees greater than 30 inches diameter are maintained in each nest area. These trees are taller than 80 feet. Large snag densities in the home range are maintained at greater than 0.5 per acre.

- c. **Marten and Fisher** Within marten and fisher management areas, practices will maintain suitable habitat at the moderate habitat capability level. Suitable habitat is characterized by dense (60-100 percent canopy), multi-storied, multi-species, climax forests with a high number of large (>24" dbh) snags and down logs. Absence of roads is preferred. No scheduled timber management will occur.
- d. **Goshawk** Limited timber management that maintains dense (60-100 percent canopy closure), multi-storied, multi-species forest with large trees (>24" dbh) and large snags is appropriate within goshawk management areas. These areas are maintained with mistletoe infections and malformed trees in order to provide nesting habitat. A network of 113 goshawk management areas, each at least 50 acres in size, is maintained across the Forest.
- e. **California Spotted Owl** Forty SOHA's are maintained across the Forest with each SOHA containing 1,650 acres. Not all SOHA's currently provide 1,650 acres of suitable spotted owl. Only those activities that increase or maintain suitable habitat are appropriate within SOHA's. Timber harvest is not scheduled in SOHA's.

# APPENDIX F - ROAD TYPE DEFINITIONS AND DEVELOPMENT GUIDELINES

## Road Type Definitions

These are the functional classification definitions for the three types of Forest roads

### **Forest Arterial Road**

Provides service to large land areas and usually connects with public highways or other Forest arterial roads to form an integrated network of primary travel routes. The location and standard are often determined by mobility and efficiency needs rather than by specific resource management service needs. It is usually developed and operated for long-term land and resource management purposes and for constant service.

### **Forest Collector Road**

Serves smaller land areas than a Forest arterial road, and is usually connected to a Forest arterial or public highway. Collects traffic from Forest

local roads and/or terminal facilities. The location and standard are influenced by long-term multiple-resource service needs as well as by travel efficiency. May be operated for either constant or intermittent service, depending on land use and resource management objectives for the area served by the facility. The road is usually 5 to 15 miles in length. The road generally serves three or more local roads.

### **Forest Local Road**

Connects terminal facilities such as campgrounds and timber harvest areas with Forest collector or Forest arterial roads, or public highways. The location and standard are usually controlled by a specific resource activity rather than travel efficiency. Forest local roads may be developed and operated for either long- or short-term service. The road may be closed until a future activity occurs or may be left open if on-going activities are necessary. The road is typically short in length (less than five miles).

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## ROAD DEVELOPMENT GUIDELINES

This chart summarizes the guidelines used to construct and maintain the different types of Forest roads.

	Functional Classification		
	Arterial	Collector	Local
Travel Speed:	Average 25+ mph	Average 10-35 mph	Average 1-20 mph
Lanes:	Generally 2 lanes	Generally 1 lane	Usually 1 lane, except for developed campgrounds.
Surface:	All Weather, generally asphalt or gravel (cinders)	All weather, gravel (cinders) or chip seal, sometimes dirt	Varies from gravel to native surface, majority native surface
Width	Typically 20-24 feet, but some 1 lane with intervisible turnouts	Typically 12 feet, but not usually	Typically 10-14 feet, Turnouts usually not intervisible or optional
Drainage:	Permanent, not to impede traffic	Permanent, but may impede traffic. May be seasonal	Usually outsloped with dips
Maintenance Level*:	3, 4, or 5	3, 4, or 5	1 - 5

\*See definitions in Appendix G

# APPENDIX G - ROAD MAINTENANCE LEVELS

The following are definitions of the five levels of maintenance of Forest roads. See Figure G-1 for a comparison of each level.

**Level 1** Roads are closed to traffic. This level is basic custodial care as required to protect the road investments and to see that damage to adjacent land and resources is held to a minimum. Level 1 maintenance requires an annual inspection to determine what work, if any, is needed to maintain drainage and keep the road stable

**Level 2** Roads are open to limited traffic. This level is used on roads where Forest management activities require that the road be open for limited passage of high clearance vehicles. Traffic is minor, usually consisting of one or a combination of administrative use, permitted use, or specialized traffic. Level 2 requires the basic care of Level 1

**Level 3** Roads are open to traffic. This level is used on roads that are open for public traffic, and generally applies when use does not exceed 15 vehicles per day average daily traffic (ADT).

ADT should be used as a guide in determining the maintenance level, but is not the sole criterion. A road may receive only one or two vehicles a day for most of the year, however, during a brief period such as hunting season, the road may receive 20 or 30 vehicles a day. Total traffic types and planned land use are important criteria for selecting maintenance level. The road is maintained for safe and moderately convenient travel suitable for passenger cars.

**Level 4** Roads are open to traffic. This level generally applies when use of a road is between 15 ADT and 100 ADT. At this level, more consideration is given to the comfort of the user. These roads are frequently surfaced with aggregate material, but some routes are paved.

**Level 5** Roads are open to traffic. This level is generally maintained for use of 100 ADT and greater. Roads in this category include both paved and aggregate surfaces. Safety and comfort are important considerations. Abrupt changes in maintenance will be posted to warn a traveler until these deficiencies are corrected.

Maintenance Level	1	2	3	4	5
	In accordance with Land Management Objectives, provide for the protection of investment, environment, adjacent resources, and user safety				
Operational Status	Closed - N/A or Intermittent Service - Closed Status	Constant Service or Intermittent Service - Open Status (Some uses may be restricted under 36 CFR 261.50)			
Traffic Type	Open for non-motorized uses Closed to motorized traffic	Administrative, permitted, dispersed recreation, specialized, minor commercial haul	All National Forest Traffic - General Use, Commercial Haul		
Vehicle Type	Closed - N/A	High clearance, pick-up, 4x4, etc	All types - passenger cars to large commercial trucks		
Traffic Volume	Closed - N/A	Traffic volume increases with maintenance level			
Surface Type	All types	Native	Native aggregate	Aggregate	Aggregate dust abated - paved
Travel Speed	Closed - N/A	Travel speed increases with maintenance level			
User Comfort and Convenience	Closed - N/A	Not a consideration	Low Priority	Moderate Priority	High Priority
Functional Classification	Closed - local, collector, arterial	Local, minor collector	Local, collector, arterial	Local, collector, arterial	Local, collector, arterial



# APPENDIX H - FIRE MANAGEMENT PROGRAM

This appendix describes (1) the Plan's fire management program, (2) the fire management effectiveness index, (3) the program's implementation, (4) annual fuel treatment, (5) expected annual acres burned by wildfire.

1 The selected fire management program in this Plan requires suppression emphasis with an increase of 20 percent from the 1991 budget. The Forest fire management organization with a 20 percent higher budget is:

- 6 prevention patrol units
- 9 engine crews
- 6 fixed lookouts
- 1 20-person inter-Regional Hotshot Crew
- 1 helicopter with initial attack crew
- 1 air attack plane
- 1 air tanker

2 The fire management effectiveness index (FMEI) is a relative measure of wildfire suppression effectiveness of the fire management organization. It is calculated by the equation:

$$FMEI = \frac{\text{Annual (FFP + FFF + NVC)} - FI}{NFAP}$$

Where FFP = the forest fire protection costs, FFF = the fire fighting costs, NVC = net value change, FI = fuels investment, and NFAP = National Forest acres protected.

The FMEI for the 1982 budget was 1.74. The FMEI for the fuels management emphasis with 20 percent more budget (proposed Plan) is also **1.74**.

3 The Fire Management Action Plan, to be prepared, will guide implementation of the selected fire management program.

4 The proposed annual extent of fuel treatment by prescribed fire through five decades is shown in Table H-1.

5 The expected annual extent of wildfire by decade for five decades, by intensity, is shown in Table H-2.

**Table H-1**

**Annual Fuel Treatment by Benefiting Resource (Acres)**

Decade	Fire Mgmt	Timber Mgmt	Range Wildlife Mgmt	Total
1	1,150	3,600	1,300	6,050
2	1,150	3,500	1,300	5,950
3	1,150	3,500	1,300	5,950
4	1,150	3,300	1,300	5,750
5	1,150	3,200	1,300	5,650

**Table H-2**

**Expected Average Annual Acres Burned by Wildfire**

Fire Intensity Class	Annual Burned Acres (by decade)				
	1	2	3	4	5
1	380	410	436	450	439
2	91	98	105	108	105
3	8	8	9	9	9
4	228	246	262	269	263
5	8	8	9	9	9
6	45	92	52	54	53
Total	760	862	873	899	878

# APPENDIX I - MINERAL LEASE STIPULATION CRITERIA

This appendix lists areas withdrawn from mineral leasing, areas or conditions for which the Forest will recommend stipulations of no surface occupancy, and areas where surface occupancy has the potential to conflict with existing uses. Exploration, development, and production phases are included. The criteria apply to the entire Forest and are, therefore, general and subject to modification in specific cases. Additional localized criteria should be considered and recommended to meet site-specific mitigation needs. Criteria for a recommendation to deny lease applications are listed in the Forest Standards and Guidelines.

## 1. *Areas Withdrawn From Mineral Leasing:*

- a. Wildernesses
- b. Wild river corridors in the Wild and Scenic River Systems
- c. Eagle Lake Planning Area (proposed withdrawal).

## 2. *Recommend No Surface Occupancy (NSO) For:*

- a. Areas used in the practice of traditional American Indian religions (sacred areas).
- b. Experimental Forests.
- c. Research Natural Areas.
- d. Areas with known populations of Sensitive plants.
- e. Proposed Wildernesses

## 3. *Areas Where Surface Occupancy Has The Potential To Conflict With Existing Uses:*

- a. Pacific Crest or National Recreation Trail
  - 200 feet therefrom for exploration and development
  - 1/2 mile therefrom for production
- b. Scenic and Recreation segments of designated Wild and Scenic River Corridors.
- c. Bald eagle nesting habitat
  - within 0.3 mile of potential nest sites
  - within 0.5 mile from active nests
- d. Peregrine falcon nesting habitat
  - within 1 mile of potential nest sites.
  - within 2 miles of active nests
- e. Golden eagle nesting habitat
  - within 0.3 mile of potential nest sites
  - within 0.5 mile of active nests
- f. Prairie falcon nesting habitat
  - within 0.3 mile of potential nest sites
  - within 0.5 mile of active nests
- g. Spotted owl territories
  - within delineated suitable habitat
  - within 0.25 mile of active nest groves
- h. Goshawk nesting habitat
  - within 0.25 of potential nest sites
  - within 0.25 of active nests.
- i. Osprey active nest
  - within 0.25 mile during nesting season
- j. Marten and fisher habitat
  - within delineated suitable habitat

- k Lakes, wetlands, shorelines - 300 yard therefrom.
- l Areas of significant geological hazards
- m Areas of highly erosive soil and slope conditions
- n Major highways - within foreground view zones
- o Major recreation travel routes - within foreground view zones
- p Developed campgrounds - within 1 mile during summer.
- q Summer home tracts - within 1 mile during summer
- r Organization camps - within 1 mile during summer.
- s Streams and lakes with significant dispersed recreation use - within 1/4 mile
- t Interpretive sites - 1/4 mile therefrom for exploration and development, 1/2 mile therefrom for production.
- u Dispersed recreation sites - within 1/2 mile for production.
- v Wilderness trails and trailheads - 1/2 mile therefrom.
- w Special Interest Areas.
- x National Natural Landmarks
- y Semi-Primitive non-motorized areas
- z Semi-Primitive motorized areas
- aa Old growth retention areas

# APPENDIX J - RECREATION OPPORTUNITY SPECTRUM (ROS)

The Recreation Opportunity Spectrum (ROS) is a system for classifying and managing recreation opportunities based on the following criteria: physical setting, social setting, and managerial setting. The combination of the three criteria result in six different ROS Classes which can briefly be described as follows:

## ***Primitive***

The area is 3 miles or more from roads and trails with motorized use and generally 5,000 acres or greater in size. The setting is essentially an unmodified natural environment with some evidence of trails. Motorized use is prohibited. The social setting provides for less than 6 parties encountered on trails and less than 3 parties visible from camp sites. Capacities range from 0.5 to 1.0 RVD/acre/year. On-site controls are extremely limited with most regulation accomplished off-site. Typical activities include hiking, canoeing, fishing, hunting, and camping. The compatible visual quality objective is Preservation. This class is currently found only in the most remote portion of the Caribou Wilderness adjacent to Lassen Volcanic National Park. All wildernesses, however, are managed to provide a primitive recreational experience.

## ***Semi-primitive Non-Motorized***

The area is 1/2 mile from roads or trails with motorized use and generally exceeds 2,500 to 5,000 acres in size unless contiguous to wilderness. There is little evidence of roads. The area is closed to motorized travel. Access roads are Maintenance Level 1. The natural setting may have subtle modifications that would be noticed, but would not draw the attention of an observer in the area. Structures are rare and isolated. The social setting provides for 6 to 15 parties encountered per day on trails and 6 or less parties visible at campsites. Capacity ranges from 2 to 3 RVD's/acre/year. On-site controls are present, but subtle. Interpretation is through self-discovery with some use of maps, brochures,

and guidebooks. Typical activities include hiking, cross-country skiing, horseback riding, canoeing, hunting, and fishing. The compatible visual quality objective is Retention. For specific management standards and guidelines, see the Semi-Primitive Non-Motorized Prescription.

## ***Semi-primitive Motorized***

The area is 1/2 mile from roads or trails with motorized use and generally 2,500 to 5,000 acres in size. There is strong evidence of roads and motorized use of roads and trails. Access roads are usually Maintenance Level 1 or 2 local roads. The natural setting may have moderately dominant alterations, but would not draw the attention of motorized observers. Structures are rare and isolated. Recreation sites may be Development Level 1 or 2. The social setting provides for a low to moderate contact with other parties. Capacity ranges from 1.5 to 2.5 RVD's/acre/year. On-site controls are present, but subtle. Interpretation is through very limited on-site facilities along with use of maps, brochures, and guidebooks. Typical activities include OHV touring, snowmobile, hiking, cross-country skiing, canoeing, hunting, and fishing. The compatible visual quality objectives are Retention and Partial Retention. For specific management standards and guidelines, see the Semi-Primitive Motorized Prescription.

## ***Roaded Natural***

The area is 1/2 mile or less from roads and trails open to motorized use. Resource modifications and utilization practices are evident, but harmonize with the natural environment. Roads may be Maintenance Levels 2 to 5. Recreation sites may be Development Level 2 to 4. The social setting provides for moderate to high frequency of contact on roads and low to moderate frequency on trails away from roads. Capacity ranges from 10 to 20 RVD's/acre/year. On-site user controls are noticeable, but harmonize with the natural environment. Typical activities in-

clude, but are not limited to hiking, cross-country skiing, downhill skiing, powerboating, snowmobiles, OHV touring, trailer camping, hunting, and fishing. The compatible visual quality objectives are Partial Retention *or* Modification.

### ***Rural***

The natural environment is substantially modified to the point that developments are dominant to the sensitive travel route observer. Structures are readily evident and may range from scattered to small dominant clusters. Pedestrian or other slow moving observers are constantly within view of culturally changed landscapes. The social setting provides for moderate to high visitor

contact. Capacity is estimated at 75 RVD's/acre/year. Recreation sites may be Development Level 3-5. Controls and regulations are obvious and law enforcement visible. Interpretation may be through more complex wayside exhibits including small lighted structures. Typical activities or facilities include, **but** are not limited to camping, fishing, information centers, convenience stores, resorts, mannas, and downhill ski areas. The compatible visual quality objectives are Modification or Maximum Modification.

### ***Urban***

Does not occur on this Forest

# APPENDIX K - RECREATION MANAGEMENT DEVELOPMENT LEVELS

<i>Development Level</i>	<i>ROS Class</i>	<i>Environmental Modification</i>	<i>Recreational Experiences</i>
1	Primitive	Minimum site modification. Rustic or rudimentary improvements designed for protection of the site rather than comfort of the users. Use of synthetic materials avoided. Minimum controls are subtle. No obvious means of regimentation. Spacing informal and extended to minimize contacts with others. Motorized access not provided or permitted.	Primitive forest environment is dominant. Rudimentary and isolated development sites beyond the sight or sound of in-harmonious influences. Maximum opportunity for experiencing solitude, testing skills, and compensating for the routines of daily living. User senses no regimentation. Feeling of physical achievement in reaching site is important.
2	Semi-Primitive Motorized, Semi-Primitive Non-Motorized	Little site modification. Rustic or rudimentary improvements designed for protection of the site rather than comfort of the users. Use of synthetic materials avoided. Minimum controls are subtle. Little obvious regimentation. Spacing informal and extended to minimize contacts with others. Motorized access provided or permitted. Primary access over primitive roads.	Little site modification. Rustic or rudimentary improvements designed for protection of the site rather than comfort of the users. Use of synthetic materials avoided. Minimum controls are subtle. Little obvious regimentation. Spacing informal and extended to minimize contacts with others. Motorized access provided or permitted. Primary access over primitive roads.
3	Roaded Natural	Site modification moderate. Facilities about equal for protection of site and comfort of users. Contemporary/ rustic design of improvements is usually based on use of native materials. Inconspicuous vehicular traffic controls usually provided. Roads may be hard surfaced and trails formalized. Development density about 3 family units per acre. Primary access to site may be over high standard well-traveled roads. Interpretive services, if available, are informal and incidental.	Forest environment is essentially natural. Important that a degree of solitude is combined with some opportunity to socialize with others. Controls and regimentation provided for safety and well-being of user are sufficiently obvious to afford a sense of security, but subtle enough to leave the taste of adventure.

<i>Development ROS Class Level</i>	<i>Environmental Modification</i>	<i>Recreational Experiences</i>
4	Rural  Site heavily modified. Some facilities designed strictly for comfort and convenience of <b>users</b> , but luxury facilities not provided. Facility designs may tend toward and incorporate synthetic materials. Extensive use of artificial surfacing of roads and trails. Vehicular traffic controls present and usually obvious. <b>Primary access usually over paved roads.</b> Development density <b>3 to 5</b> family units per acre. Plant materials usually native. Visitor Information Services frequently available.	Forest environment is pleasing and attractive, but not necessarily natural. Blending of opportunities for solitude and socializing with others. Testing of outdoor skills on site mostly limited to camping activity. Many user comforts available. Contrast to daily living routines is moderate. Invites marked sense of security.

# APPENDIX L - RECREATION CONSTRUCTION PROJECTS AND PRIORITIES

## ***A. Trail and Trailhead Construction/Reconstruction***

The Forest's trail construction and reconstruction goal is **35** miles per decade. The following are potential trails and trailhead construction projects by Ranger District. Priorities may shift due to additional demand and site information as well as budget allocations.

### **Almanor District:**

<u>Trail Name</u>	<u>Miles</u>	<u>Trailheads</u>
1 Trail Lake	0.5	1 Snowmobile (2)
2 Ishi Wilderness	15	2 Domingo Springs
3 Star Lake	1	3. Deer Creek-Ishi
4 Lower Mill	1	4 Black Rock-Ishi
5. Lotts Lake	1	5 Humbug-PCT
6. PCT to Sunflower Flat	1	6 Humbolt-PCT
7 Henry's Flat-OHV bypass	1	7. PCT-Highway <b>36</b>
8 Battle Creek	<b>2.5</b>	
9 Blue Lake	<b>2</b>	
10 Heart Lake Expansion	<b>2</b>	
11 Cross country ski	<u><b>8</b></u>	
	<b>35</b>	

### **Eagle Lake District:**

<u>Trail Name</u>	<u>Miles</u>	<u>Trailheads</u>
1. Homer Lake Trail	0.8	1 Homer Lake Trailhead
2 Crater Mountain Trail	1.5	2. Snowmobile (2)
3 Eagle Lake Trails	<b>35</b>	3 Rails to Trails at
4. Fredonyer, Willard Creek, Coppervale, Bogard (X-Country Ski)	<u>7</u>	a. Goumaz b. Mason Station
	<b>44.3</b>	4 Eagle Lake

### **Hat Creek District:**

<u>Trail Name</u>	<u>Miles</u>	<u>Trailheads</u>
1 Twin Lakes-Durbin Lake	<b>2</b>	1 Cypress Camp-1000 Lakes
2 Crater Peak-Bunchgrass	<b>3</b>	2 Heart Lake-Digger Creek
3 Rock Creek	1	3 Tamarack-1000 Lakes
4 Spattercone Crest Expansion	<u><b>2</b></u>	
	<b>8</b>	



Total potential trail construction for all Districts is 87.3 miles. The total number of trailheads for all Districts is 17. Reconstruction miles are determined by trail condition inventories. Additional miles of OHV routes will be added to the trail system primarily from the existing road system. Construction for OHV routes is expected to be minimal.

## ***B. Recreation Facility Construction Projects***

The following is a list of the high priority recreation construction projects. The Forest's goal is to complete at least three high priority projects in the first decade. Projects to be proposed for the first decade are (a) Hat Creek Group Campground, and (b) Almanor Beach and Campground Expansion and (c) Bogard Rest Stop Information/Interpretive Center

### Almanor District

- 1 Lake Almanor Complex Campground Expansion & Day Use Area Development
- 2 Elam Creek Interpretive Site
- 3 Gurnsey Creek Campground Rehabilitation
- 4 Prattville Group Camp Area
- 5 Gathers Campground
- 6 Mill Creek Campground
- 7 Day Use Area-Highway 89 and Super Ditch
- 8 Echo Lake Day Use Area
- 9 Willow Lake Day Use Area
10. Fleishmann Lake Campground
- 11 Hole-in-the-Ground Campground Expansion
- 12 Lower Deer Creek Rest Area
- 13 Colby Meadows Recreation Complex

### Eagle Lake District

- 1 Bogard Rest Stop Info/Interpretive Center
- 2 Mernill Campground Reconstruction
- 3 Christie Campground Expansion
4. Eagle Lake Campground Expansion
- 5 West Eagle Group Campsites
- 6 Goumaz Crossing Campground
- 7 Eagle Lake Info/Interpretive Center
8. Butte Creek Campground Improvement

### Hat Creek District

- 1 Hat Creek **Group** Campground
- 2 Hat Creek Amphitheater
- 3 Bndge Day Use Expansion
- 4 Upgrade Hat Creek Valley Campgrounds
- 5 Highway **44** Vista Point/Interpretive Stop Replacement
- 6 Spattercone Crest Geologic Picnic & Parking
- 7 Deep Hole Crater Interpretive/Day Use Site
- 8 CCC Ponds Fishing Day Use Area
- 9 Lassen Visitor Center

# APPENDIX M - TIMBER STRATIFICATION

This appendix explains the timber stratification process—how timber types were grouped into timber strata on this Forest. Stratification is done to facilitate analysis of a reasonable number of land units that respond similarly to management prescriptions.

## 1. *Background*

Timber types are relatively homogeneous vegetative units that were delineated on 1978 aerial photographs. Timber type labels consist of one or two species codes, a size class, and a density class. An estimated 700 to 900 unique timber types were differentiated on the Forest. Their stratification into homogeneous response units is necessary for efficient inventory sampling and yield table development and use.

## 2. *Procedure*

- a. Aggregate timber types by dominant species to form major types (e.g., mixed conifer, red fir)
- b. Combine the four density classes of timber types into two classes: greater than 40 percent crown cover and less than 40 percent crown cover
- c. In general, combine medium and large sawtimber into one size class and small sawtimber and poles into another size class. (This part of the stratification procedure is initially done in the field.)

## 3. *Ecological Considerations*

a. Timber types are grouped differently into each timber stratum to reflect different ecological conditions. For example, ponderosa pine stands in the northeastern part of the Forest, which have different characteristics than those in the western part, went into the eastside ponderosa pine type. Westside ponderosa pine went into the mixed conifer type.

b. Since lodgepole pine makes up only five percent of the commercial timber acreage, all lodgepole timber types are combined into one stratum.

## 4. *Stratification Results*

Figure M-1 shows how the commercial timber types (mixed conifer, eastside pine, red fir, and lodgepole pine) were combined into timber strata.

**Figure M-1**

**Stratification of Timber Types**

***Eastside Pine***

Applies only to eastside map numbers **1-9, 12-15, 17-24, 32-45, 55, 56, and 99**  
with type labels beginning with **PP, PPLC, PPLP, and PPSP**

**Crown Closure:**

S-Sparse <b>10-19%</b>	and	P-Poor <b>20-39%</b>		N-Not Fully Stocked <b>40-69%</b>	and	G-Good <b>70%+</b>
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**Size Class:**

**1 - Saplings**

**P1X**

**2 - Poles**

**P2P**

**P2G**

**3 - Small Sawtimber**

**4 - Medium Sawtimber**

**5 - Large Sawtimber**

**P4P**

**P4G**

**6 - Two-stoned**

**N/A**

**P6**

***Mixed Conifer***

Applies to any timber type label beginning with **WF, SP, DF, and PP**  
(except as noted above for eastside pine)

**Crown Closure:**

S-Sparse <b>10-19%</b>	and	P-Poor <b>20-39%</b>		N-Not Fully Stocked <b>40-69%</b>	and	G-Good <b>70%+</b>
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**Size Class:**

**1 - Saplings**

**M1X**

**2 - Poles**

**M3P**

**M3G**

**3 - Small Sawtimber**

**4 - Medium Sawtimber**

**5 - Large Sawtimber**

**M4P**

**M4G**

**6 - Two-stoned**

**N/A**

**M6**

***Red Fir***

Applies to any label beginning with **RF and MH**

**Crown Closure:**

S-Sparse <b>10-19%</b>	and	P-Poor <b>20-39%</b>		N-Not Fully Stocked <b>40-69%</b>	and	G-Good <b>70%+</b>
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**Size Class:**

**1 - Saplings**

**R1X**

**2 - Poles**

**R3P**

**R3G**

**3 - Small Sawtimber**

**4 - Medium Sawtimber**

**5 - Large Sawtimber**

**R4P**

**R4G**

Note All lodgepole pine timber types are aggregated into the LPX stratum

# APPENDIX N - VISUAL QUALITY OBJECTIVES

This appendix briefly describes visual quality objectives

## Definitions

Visual Quality Objectives are standards for the visual management of all Forest lands. They have been assigned to each acre of the Forest based on the public's concern for scenic quality as well as diversity of natural features. For a description of the process used to arrive at these objectives, see the FEIS Visual Resource, Affected Environment, Chapter 3. There are five visual quality objectives: preservation, retention, partial retention, modification, and maximum modification.

**Preservation (P)** - This allows ecological changes only. Most management activities are prohibited. Trails, trail bridges, and other trail related improvements are designed and located to be visually unobtrusive.

**Retention (R)** - Management activities result in a natural appearing landscape. Activities may occur, but are not visually evident to the casual observer. Activities repeat form, line, color, and texture found frequently in the characteristic landscape. Changes in the qualities of size, amount, intensity, direction, and pattern should not be evident. Reduction in form, line, color, and texture contrast to meet retention should be accomplished either during operation or immediately after.

**Partial Retention (PR)** - Management activities remain visually subordinate to the characteristic landscape. Activities and structures may repeat form, line, color, or texture common to the characteristic landscape, and may also introduce form, line, color, or texture which are found infrequently or not at all in the characteristic landscape. Reduction in form, line, color, and texture contrast to meet partial retention should be accomplished as soon after project completion as possible or at a minimum within the first year.

**Modification (M)** - Management activities may dominate the original landscape.

However, activities of vegetative and land form alteration must borrow from naturally established form, line, color, or texture so completely, and at such a scale, that its visual characteristics are those of natural occurrences within the surrounding area or character type. Reduction in form, line, color, and texture contrast to meet modification should be accomplished in the first year.

**Maximum Modification (MM)** - Management activities of vegetative and landform alterations may dominate the characteristic landscape. However, when viewed as background, the visual characteristics must be those of natural occurrences within the surrounding area or character type. When viewed as foreground or middle-ground, they may not appear to borrow from naturally established form, line, color, or texture. Alterations may also be out of scale or contain detail that is incongruent with natural occurrences as seen in foreground or middle-ground. Reduction of contrast to meet maximum modification should be accomplished within five years.

## Meeting Visual Quality Objectives

Many of the design principles used to develop visual quality objectives can also be used on project level activities to minimize impacts and help meet the visual quality objective. General guidelines for meeting retention and partial retention are found in the View Prescription. Modification and Maximum Modification VQO guidelines are found in the Timber Prescription. More detailed guidance is found in the visual resource management handbooks.

- USDA Handbook Number 462, National Forest Landscape Management Volume 2 Chapter 1, The Visual Management System
- USDA Handbook Number 559, National Forest Landscape Management Volume 2 Chapter 5, Timber
- USDA Handbook Number 434, National Forest Landscape Management Volume 1

# APPENDIX O - WILDLIFE HABITAT CAPABILITY MODELS FOR MANAGEMENT INDICATOR SPECIES

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Rainbow Trout	19
Spotted Owl	20
Steelhead/Chinook Salmon	21
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The models define High, Medium, and Low habitat Capability “High” describes preferred habitat that exceeds minimum requirements for species viability “Medium” describes the minimum habitat to meet species viability needs. “Low” describes marginal habitat that species can use, but it will not permit their successful reproduction.

Wherever Management Area Direction emphasizes a species, species group, or special habitat, management will provide for High or Medium habitat capability for that species or species group. It is assumed that by providing these habitat characteristics, viability of populations dependent on these characteristics will be guaranteed.

Habitat Capability Models are based on information found in professional literature, the professional judgement of species authorities, and the judgement of Forest Service and other agency biologists. Models represent the best information available to date and are updated as better information becomes available.

Habitat capability Models are used as the basis for broad level Forest planning and more specific project level planning, implementation, and evaluation. When Management Area Direction emphasizes particular species, objectives for desired habitat conditions are based on these models. In addition, habitat characteristics defined in the models help develop project design, management prescriptions, and mitigation requirements. In essence, the models are the standards upon which management decisions are based.

## Introduction

This appendix lists the Forest’s 18 wildlife and fish Management Indicator Species (MIS) and Wildlife Habitat Capability Models for each of them. Models are also included for Canada goose and snag habitat because they are referenced several times in the Standards and Guidelines in Chapter 4. Canada goose is not a Management Indicator Species. Models for most of these species are found in *Fish and Wildlife Habitat Capability Models and Special Habitat Criteria for the Northeast Zone National Forests*, edited by Shimamoto and Arrola (1981). These models are available in the Planning Records.

### Management Indicator Species for the Lassen National Forest are:

Bald Eagle	Hairy Woodpecker	Pileated Woodpecker
Black Bear	Mallard	Pronghorn Antelope
Bufflehead	Marten	Rainbow Trout
Chinook Salmon	Mule Deer	Spotted Owl
Fisher	Osprey	Steelhead Trout
Goshawk	Peregrine Falcon	Western Gray Squirrel

**BALD EAGLE**

LIFESTAGE ALL

SEASON(S) Spnng and Summer

AREA Northern California

HABITAT VARIABLE	HABITAT CAPABILITY		
	(Suitable*)		(Unsuitable*)
	HIGH (Preferred)	MEDIUM (Required**)	LOW (Marginal)
Vegetation Types and Successional stages 5f, 6f	ponderosa pine 4A, 5 mured comfer 4A, 5 eastside pine 4A, 5 mixed evergreen 4A	red fir 4A, 5 lodgepole pine 3A, B, C pine-jumper 4A ponderosa pine 4B mlxed comfer 4B mured evergreen 4B	red fir 4B, 4C lodgepole pine 4A, B, C black oak eastside pine 4C mxed conifer 4C mxed evergreen 4C
Nest Tree	dominant ponderosa pine, Jeffrey pine or sugar pine, > 38" DBH large limbs, open crown	dominant ponderosa pine, Jeffrey pine, or sugar pine, 28-38" DBH, large limbs, open crown	other tree species
Pilot Trees	2-3 snags or spike top trees/acre within 1/4 mile of the nest, of which 1 snag is >24" DBH	2-3 snags or spike top trees or open canopy live trees/acre within 1/4 mile of the nest, >16" DBH	<2 snags/acre>16" DBH
Food Supply	Abundant supply of cold and warm-water fish and/or waterfowl		Trout
Distance from nest tree to food supply	<1/2 miles	1/2- 1 mile	> 1 mile
Disturbance	Frequent foot traffic, vehicular traffic and/or logging >1/2 mile from nest, January to August	Frequent foot traffic, vehicular traffic and/or logging 1/4 to 1/2 mile from nest, January to August	Frequent foot traffic, vehicular traffic and/or logging <1/4 mile from nest, January to August
Nest Territory			
<i>Primary Zone</i>	>300 acres	40-300 acres	<40 acres
<i>Secondary Zone</i>	The size will be determined by local topography and resulting visibility from the nest. As a minimum, 10 acres should be included in the secondary zone		<30 acres
Elevation	<6000 feet	6000-7400 feet	> 7400 feet

**BLACK BEAR**

LIFESTAGE ALL

SEASON(S) All

AREA Northern California

HABITAT VARIABLE	HABITAT CAPABILITY		
	(Suitable*)	(Unsuitable*)	
	HIGH (Preferred)	MEDIUM (Required**)	LOW (Marginal)
Year-Round Vegetation Types	coniferous forests, except subalpine forest		subalpine forest
Key Seasonal Vegetation Types			
<i>Spring - Summer</i>	meadow and riparian areas		
<i>Summer - Fall</i>	montane shrub with a high proportion of manzanita and Prunus species (for berries)		
<i>Fall</i>	oak woodlands (for acorns)		
Den Sites	caves, uprooted trees, boulder crevices, log piles, hollow logs		
Dead and Down	30-40 tons/acre of 10+\" sound wood and 3+\" rotten wood (>65% in 10+\" sound wood)	20-30- tons/acre of 10+\" sound wood and 3+\" rotten wood (265% in 10+\" sound wood)	<20 or >40 of 10+\" sound wood and 3+\" rotten wood (<65% in 10+\" sound wood)
Road Density	<1/2 mdsq mi	1/2 - 5 mdsq mi	>5 m/sq mi
Year-Round Home Range			
<i>Adult male</i>	1-4sq mi	4-10 sq mi	>10 sq mi
<i>Adult female</i>	1-4 sq mi	4-6 sq mi	>6 sq mi
<i>Female with cubs</i>	1-2 sq mi	2-5 sq mi	>5 sq mi
<i>Sub-adult</i>	1-8sq mi	8-10 sq mi	>10 sq mi

**BUFFLEHEAD**

LIFE STAGE Nesting and Broodreannng

SEASON(S): April through July

AREA Northeastern California

HABITAT VARIABLE	HABITAT CAPABILITY		
	(Suitable*)	(Unsuitable*)	
	HIGH (Preferred)	MEDIUM (Required**)	LOW (Margmal)
Nesting and Broodreannng	Permanent or ephemeral lakes less than 8000ft elevation with substantial numbers (>5/acre) of snags within 200 of the shoreline, abundant aquatic invertebrate populations, and minimum high speed motorboat disturbance	Permanent or ephemeral lakes less than 8000 ft elevation with moderate snag densities (1.5 - 5 per acre) within 1/8 mile of the shoreline and abundant aquatic invertebrate populations	Lakes less than 8000 ft elevation with moderate to high levels of human disturbance, less than 15 snags/acre within 1/8 mile of the shorelme
Nestmg Cover	Large snags (≥16") with suitable canties interspersed with live timber within 200 feet of the shoreline of a suitable lake -or- Manmade nest boxes attached to trees within 200 feet of a lake shoreline	Snags (≤16") with suitable cavities within 1/8 mile of the shoreline of suitable lake	Large snags with suitable canties greater than 1/8 mile from a suitable lake
Forage Needs	Shallow lakes with abundant macroinvertebrate populations, and low fish densities	Lakes with moderate macroinvertebrate populations, often with significant fish populations	Lakes that have low densities of macroinvertebrates, often with significant fish populations
Water Management	Little or no fluctuation of water levels throughout the nesting season	Minor fluctuation of water level throughtout the nesting season	Moderate to high fluctuations of water level dunnng nesting season
Disturbance	Little or no human disturbance in nesting areas	Low recreation use of shoreline/nesting areas dunnng all phases of nesting and broodreannng	Heavy recreational use in nestmg and broodreannng areas



**CANADA GOOSE**

LIFE STAGE Nesting and Broodrearing

SEASON(S) Spring

AREA Northern California

HABITAT VARIABLE	HABITAT CAPABILITY		
	(Suitable*)		(Unsuitable*)
	HIGH (Preferred)	MEDIUM (Required**)	LOW (Marginal)
Nesting			
Wetland Type and Size	Ponds > 50 acres, marshes >50 acres, rivers	Ponds 20-50 acres, marshes 20-50 acres, rivers	Ponds <20 acres, marshes <20 acres, creeks
Nest sites	Elevated nest sites in water, at densities of 1 site per 3-10 surface acres of water, spaced >200 feet apart, and >50 feet from shore  (Sites include natural or man-made island, metal tubs, muskrat houses, etc )	Same as high, except density of sites is 1 site per 1-15 surface acres of water Some sites are located on the shoreline	Few elevated nest sites which are located adjacent to open water
Water Management	Maximum water levels (≥18") in nesting areas are reached 3 weeks prior to the onset of laying and maintained after hatching Ponds at least 2 1/2 feet deep	Maximum water levels (≥18") reached by the onset of laying Slow drawdown after laying commences	Water in nesting areas generally ≤18" deep Fluctuating water levels throughout nesting season
Forage Needs	High invertebrate populations in wetlands Green upland grasses available near shoreline Dense stands of submerged aquatics	Moderate invertebrate populations Green upland grasses available near shoreline	Low invertebrate populations Green upland grasses available
Disturbance	No human disturbance in nesting areas No domestic or feral dogs in nesting areas Low predator populations (coyotes, gulls, ravens, skunks, foxes)	Low recreation use (shoreline fishing, bird-watching, etc ) in nesting areas during laying and incubation period No domestic or feral dogs Low predator populations	Heavy recreational use (fishing, boating, etc ) in nesting areas during laying and incubation Domestic or feral dog packs in nesting areas High predator populations

**CANADA GOOSE (continued)**

LIFE STAGE Nesting and Broodreanng

SEASON(S) Spnng

AREA Northern Cahforma

HABITAT VARIABLE	HABITAT CAPABILITY		
	(Suitable*)	(Unsuitable*)	
	HIGH (Preferred)	MEDIUM (Required**)	LOW (Marginal)
Broodreanng			
Forage Needs	High invertebrate populations, mowed and/or grazed wet meadows adjacent to open water, dense submerged succulent upland grasses adjacent to open water	Moderate invertebrate populations; emergent aquatic plants available, some beds of submerged aquatics, succulent upland grasses near water	Low invertebrate populations; scattered emergent plants; upland annual grasses dry by late June
Escape Cover	Wetland with >40% emergent plant cover (cattail, bullrush, Juncus) Some areas with water ≥30" deep Brood ponds 250 acres	Wetland with 20-40% emergent plant cover Some areas >24" deep Brood ponds 250 acres	Wetland with <20% emergent plant cover. Most areas of water <24" deep Brood ponds ≤ 50 acres
Water Management	Broodreanng ponds have permanent water or slow water drawdown after July 10 Sufficient water to fledge young until July 30	Slow water drawdown occurs after June 20 Sufficient water to fledge young until July 15	
Disturbance	Low levels of human actavity on broodreanng ponds (geese are not harassed)	Moderate levels of human activity (broods are not forced to move to avoid human contact)	High levels of recreational actinties (broods are forced to move to avoid human contact)

1/ Canada goose was not selected as a management indicator species on the Lassen National Forest

**FISHER**  
SEASON(S) All

LIFESTAGE ALL  
AREA California

HABITAT VARIABLE	HABITAT CAPABILITY		
	(Suitable*)	(Required**)	(Unsuitable*)
	HIGH (Preferred)	MEDIUM (Required**)	LOW (Marginal)
Home Range	6,000 acres, 8 mile linear limit (Buck 1989)	9,800 acres, > 8 miles actual limit	11,300 acres, undefined
Seral Stage 5/1 Denning/Resting	5 (old growth) 4 (mature)	5.4	5.4
Foraging	5, 4 3 (midsuccessional)	5, 4, 3	5, 4, 3
Minimum Stand Size	>120 acres adjacent mature timber >500 acres adjacent open canopied areas	80-119 acres adjacent mature timber 200-499 acres adjacent open canopied areas	60-79 acres adjacent mature timber 120-199 acres adjacent open canopies
Denning/Resting Canopy Closure Class 6/	>80% WHR Class C	61-80% WHR Class B	40-60% WHR Class B
Home Range Stand Structure 5/, 6/	70-80% mature closed conifer (≥4C) If unavailable, 50-60% 24C & 20-30% ≥4B  25-30% mixcon/hardwoods (≥4B) If unavailable, 15-20% 24B or 3C; 10-15% 23C or 3B  5% hardwood/other (≥4A HW/≥3A-4A other)	60-70% mature closed conifer (≥4C) If unavailable, 40-50% 24C & 20-30% 24B  20-25% mixcon/hardwoods (≥4B) If unavailable, 10-15% 24B or 3C, 10-15% 23C or 3B  5-10% hardwood/other (≥4A HW/≥3A-4A other)	50-60% mature close conifer (≥4C) If unavailable, 30-40% >4C & 20-30% 24B  30-40% mixcon/hardwoods (≥4B) If unavailable, 15-20% 24B or 3C, 15-20% 23C or 3B  10-20% hardwood/other (≥4A HW/≥3A-4A other)
Riparian/Wet Meadows (proximity to denning and resting habitat)	<1/4 - 1/2 mile	1/2 - 1 mile	1-2 miles
Vertical diversity (denning, resting and foraging areas)	3-4 layers plus shrubs	2-3 layers plus shrubs	2 layers plus shrubs
Openings Without Cover	<1 ac each	1-2 ac each	2-3 ac each

**FISHER (continued)**

LIFESTAGE ALL

SEASON(S) All

AREA California

HABITAT VARIABLE	HABITAT CAPABILITY		
	(Suitable*)	(Suitable*)	(Unsuitable*)
	HIGH (Preferred)	MEDIUM (Required**)	LOW (Marginal)
Snag Densities (Minimums)			
<i>Resting/Denning (No)</i> (4-5C stands) (Size) 5/, 6/	>2/acre 2-4 DBH	1-2/acre ≥30-43" DBH	0.5-1/acre ≥24-29" DBH
<i>Live tree snag (dens)</i> <i>replacement</i>	≥6/ac >44" DBH	3-6/ac (30-43" DBH)	1.5-3/ac (24-29" DBH)
<i>Foraging Areas (No)</i> (3-5C stands) (Size) 5/, 6/	4-5/acre >20" DBH	2-3/acre >20" DBH	1/2 - 1/acre >15" DBH
<i>Live tree snag</i> <i>replacement (foraging)</i>	12-15/ac >20"	9-18/ac >20" DBH	4.5-9/ac > 1.5 DBH
Downed Logs (No) (hunting use) (Size)	>4/acre >30" x 15ft	2-3/acre >20" x 15 ft	1- 2/acre >20" x 15 ft
Road Density	0-<1/2 mdsq mi	1/2 - 2 mdsq mi	2-3 mdsq mi
Travel Comdor Width	2600 ft within mature stands 21200 ft adjacent to clearcuts	300-599 R within mature stands 600-1199 R adjacent to clearcuts	100-299ft within mature stands 300-599 ft adjacent to clearcuts
Travel Comdor Canopy Closure	>60%	50-60%	40-50%
Habitat Spacing Distance	≤3 miles	3-8 miles	>8-12 miles

GOSHAWK  
SEASON(S) All

LIFESTAGE ALL  
AREA Northern California

HABITAT VARIABLE	HABITAT CAPABILITY		
	(Sutable*)	(Sutable*)	(Unsuitable*)
	HIGH (Preferred)	MEDIUM (Required?)	LOW (Marginal)
Territory/Home Range	22 high capability sites	21 high capability site, $\geq 1$ medium capability site	1 medium capability site, 21 low capability site
Distance between nest stands	1 - 5 mile	< 1 or 5 - 2 miles	> 2 miles
Habitat pattern	>5 vegetation types, >3 seral stages	3-5 Vegetation types, 3 seral stages	<3 vegetation types, <3 seral stages
Area	<1 mile from nest stand	1-2 miles from nest stand	>2 miles from nest stand
Nest Stand			
Area	40-100 acres	25-40 acres or > 100 acres	< 25 acres
Vegetation types	Douglas-fir, ponderosa pine, mured conifer, Jeffrey pine, red fir	npanan, aspen, lodgepole pine, black oak	Other vegetation types
Successional stages 5/, 6/	4B, 4C, 5	3B, 3C	2, 3A, 4A
Average canopy cover	60-90%	40-60%	<40% or >90%
Canopy covering ( $\geq 0$ 1 acre)	$\geq 2$ within stand	1 within stand	0
Slope	<25%	25-50%	>50%
Distance to water	< 25 mile	25 - 1 mile	> 1 mile
Distance to opening (>0 1 acre)	< 25 mile	25 - 1 mile	> 1 mile
Prey-plucking sites	Topped trees, stumps, logs, or horizontal limbs below canopy		

**HAIRY WOODPECKER**

LIFESTAGE ALL

SEASON(S) All

AREA Northeastern California

HABITAT VARIABLE	HABITAT CAPABILITY		
	(Suitable*)		(Unsuitable*)
	HIGH (Preferred)	MEDIUM (Required**)	LOW (Marginal)
Vegetation Types and Successional Stages 5/, 6/	mlxed conifer 4A, 4B red fir 4A, 4B	subalpine forest 4A, 4B eastside pine 4A, 4B npanan-deciduous 1A, 1B ponderosa pine 4A, B Douglas-fir 4A, B	black oak 3A, 3B, 4A, 4B muted conifer 4C red fir 4C eastside pine 4C lodgepole pine 4C
Nest Sites and Condition	soft snags	hard snags, dead portion of live tree	live trees, stumps, logs
Nest Tree Species	white fir	Jeffrey pine,ponderosa pine, red fir,lodgepole, aspen, cottonwood	black oak
Average Nest Tree Diameter (DBH)	>17 in	15-17 in	< 15 in
Average Nest Tree Height	>45 ft	34-45 ft	<34 ft
Forage Sites and Conditions	hard snags	soft snags, live trees	
Snag Density Within Territory (territory = 6-25 acres)	(See Habitat Capability Model for "Snags")		
Downed Logs (per acre)	>3 uncharred class 1 or class 2 logs, >12 in diameter at large end, > 20 ft in length	2 uncharred class 1 or class 2 logs, >12 in diameter at large end, > 20 ft in length	<2 uncharred class 1 or class 2 logs, >12 in diameter at large end, > 20ft in length

**MALLARD**

SEASON(S) Aprnl through July

LIFE STAGE Nesting and Broodreannng

AREA Northern California

HABITAT VARIABLE	HABITAT CAPABILITY		
	(Sutable*)	(Required**)	(Unsuitable*)
	HIGH (Preferred)	MEDIUM (Required**)	LOW (Marginal)
Nesting			
<i>Breeding Pair Habitat</i>	Irregular shorelines with some exposed banks, small shallow potholes mthm 1/2 mile of smtahle nestmg cover, numerous small hummocks or islands mthm wetlands	Irregular shorelines around wetlands with some exposed banks	Regular shaped shorelines around wetlands with exposed banks
<i>Nesting Cover</i>	Tall (≥16'), dense nesting cover (DNC) in uplands mthin 1/4 mile of open water, in blocks 280 acres Upland cover mix of grasses, forbs, and shrubs  and/or Natural or manmade islands in wetlands ≥ 03 acres in size with a tall, (≥16") dense mixtute of residual grasses and forbs, density of 1island per 1-5surface acres of water	Upland DNC within 1/2 mile of open water, in blocks ≥ 50 acres Upland cover mix of grasses, forbs, and shrubs  and/or Islands (as descnbed under "high), density of 1island per 6-10 surface acres of water.	No islands in wetlands Uplands nesting cover of low shrubs and grasses ≤ 1 6high
<i>Forage Needs</i>	Numerous dense beds of submerged aquatic plants Abundant invertebrate populations	Scattered beds of submerged aquatics Moderate invertebrate populations.	Few submerged aquatics Low invertebrate populations
<i>Water Management</i>	Maximum water levels reached by March 15 Little or no fluctuation throughout nestmg season	Maximum water levels reached by Aprnl 1 Minor fluctuation dunnng early nesting penod	Moderate to high water fluctuahons dunnng nesting season
<i>Disturbance</i>	No human disturbance in nesting areas No domestic or feral dogs in nesting areas Low populations of predators (coyote, gulls, ravens, skunk, fox)	Low recreation use (shoreline fishing, birding, etc )of nesting areas during laymg and incubation period No domestic or feral dogs in nesting areas Low populations of predators (coyote, gulls, ravens, skunk, fox)	Heavy recreation use (fishing, boating) in nesting areas during laying and incubation penods Domestic or feral dogs in nesting areas Moderate to high populations of predators

HABITAT VARIABLE	HABITAT CAPABILITY (Suitable*)		
	HIGH (Preferred)	MEDIUM (Required**)	LOW (Marginal)
Broodrearing Forage Needs	Numerous dense beds of submerged aquatic plants Abundant invertebrate populations	Scattered beds of submerged aquatic plants Moderate invertebrate populations	Few submerged aquatic plants and low invertebrate populations
Escape Cover	Scattered stand of dense emergent vegetation along shoreline (bulrush, cattail, <b>Juncus</b> , <b>Eleocharis</b> ), 50% open water, 50% emergent plant cover.	50-70% open water and 30-50% emergent plant cover	Scattered stands of emergent vegetation (<30%)
Water Management	Broodrearmg ponds >25 acre Maximum water depth 4 8 with at least 50% of the wetland fringe ≤20" deep Water available through September	Broodreanng ponds 1-25 acres Maximum water depth 48' wlth 25-49% of the wetland fringe ≤20" deep Water available until Sept 15	Broodrearmg ponds <1 acre Most of pond deeper than 4 8 dunnng rearing penod or water available only until August 15
<i>Disturbance</i>	Low levels of human activlty on or near ponds (ducks broodreannng are not harassed)	Moderate levels of human activity (broods are not forced to move to avoid human contact)	High levels of recreational activlty (broods are moved to avoid human contact)



HABITAT VARIABLE	HABITAT CAPABILITY		
	(Suitable*)		(Unsuitable*)
	HIGH (Preferred)	MEDIUM (Required**)	LOW (Marginal)
Home Range	1,400 acres	2,100 acres	2,500 acres
Seral Stage 5/ <i>Denning / Resting</i>	5 (old growth) 4 (mature)	5, 4	5, 4
<i>Foraging</i>	5,4 3 (midsuccessional)	5, 4, 3	4, 3
Minimum Stand Size	> 120 ac, adjacent mature stands	80-119 ac, adjacent mature stands	60-79 ac, adjacent mature stands
	>500 ac, adjacent open canopied areas	200-499 ac, adjacent open canopied areas	120-199 ac, adjacent open canopied areas
Denning, Resting Canopy Closure Class 6/	>70% WHR Class C	41-70% WHR Class B, C	30-40% WHR Class A, B
Stand Structure	50% mature ≥4C (if unavailable 35% ≥4C & 15% ≥4B)	35% mature >4C (if unavailable 20% ≥4C & 20% 4B)	25% mature ≥4C (if unavailable 15% ≥4C & 10% ≥4B)
	30% >4B (if unavailable 15% >4B or 3B & 15% ≥3C or 3B)	15% >4B (if unavailable 25% ≥4B & 20% ≥3C or 3B)	55% >4B (if unavailable 30% ≥4B & 25% ≥3C or 3B)
	20% >4A/other	20% >4A/other	20% >4A/other
Basal Area	≥350 sq ft per acre	176-350 sq ft per acre	5 sq ft per acre
Openings	<1 acre each	1 -2 acres each	2 - 3 acres each
Riparian/Wet Meadows proximity to closed canopy stands	<1/4 mile	1/4 - 1/2 mile	1/2 - 1 mile
Travel Corridor Width	>300 ft within mature stands	>150 - 299 ft within mature stands	>100 - 149 ft within mature stands
	>600 ft , adjacent open/no canopy	300-599 ft , adjacent open/no canopy	200-299 ft , adjacent open/no canopy
Travel Corridor Canopy Closure	60%	50-60%	40-50%
Habitat Spacing	≤2 miles	>2-3 miles	>3-6 miles
Snag Densities. (Minimums)			
<i>Resting / Denning</i> (No ) <i>areas</i> (Size)	>3/acre (>24" DBH)	2-3/acre (>24" DBH)	1-2/acre (20-23" DBH)
<i>Foraging</i> (No ) <i>Areas</i> (Size)	>3/acre (>15" DBH)	>3/acre (>15" DBH)	>2/acre (>15" DBH)
<i>Live Tree Snag</i> (No ) <i>Replacements</i> (Size) (dens)	>9/acre (>24"DBH)	>9/acre (>24"DBH)	>3-6/acre (>24"DBH)
<i>Live Tree Snag</i> (No ) <i>Replacements</i> (Size) (forage)	>9/acre (>15"DBH)	>9/acre (>15"DBH)	>6/acre (>15"DBH)
Dead and Downed (No ) Logs (Size)	≥20/acre (≥15" x 15ft)	≥10-19/acre (≥15" x 15ft)	≥5-9/acre (≥15" x 15ft)
Road Densities Paved	< 1 mi/ sq mi	< 1-2 mi/ sq mi	< 2-3 mi/ sq mi

**MULE DEER**

LIFESTAGE ALL

SEASON(S) All

AREA Northeast California

HABITAT VARIABLE	HABITAT CAPABILITY		
	(Suitable*)	(Unsuitable*)	
	HIGH (Preferred)	MEDIUM (Required**)	LOW (Marginal)
<b>Cover Stands</b>			
Vegetation Types and Successional Stages 5/, 6/	ponderosa pine 2B, 2C, 3B, 3C, 4B, 4C, 5 mixed conifer 2B, 2C, 3B, 4B, 4C, 5 red fir 2B, 2C, 3B, 3C, 4B, 4C, 5 western juniper riparian-deciduous mountain mahogany aspen, big sagebrush	lodgepole pine 2A, 3A, 4A ponderosa pine 2A, 3A, 4A mixed conifer 2A, 3A, 4A red fir 2A, 3A, 4A cottonwood, black oak, montane shrubs, bitterbrush	plantations (<1" DBH), seedling/ sapling stage of all conifers, wet meadow, rabbitbrush, silver sagebrush, low sagebrush, perennial or annual grass/forbs
Stand Size	20-60 acres	10-20 acres or 60-120 acres	<10 acres or >120 acres
Canopy Closure			
<i>Shrubs</i>	50-85%	30-50% or 85-90%	<30% or >90%
Trees	>40%	20-40%	<20%
Shrub Age Class	Mature	Decadent	Young, seedlings
<b>Forage Stands</b>			
Vegetation Types and Successional Stages 5/, 6/	riparian deciduous, montane shrubs, mountain mahogany, black oak, aspen, bitterbrush, wet meadow, perennial & annual grass/forbs, seedling/sapling stages of all conifers	big sagebrush, low sagebrush, ponderosa pine 2A, 3B, 4A, wetlands, red fir 2A, 3A, 4A mixed conifer 2a, 3A, 4A western jumper	ponderosa pine, 2B, 2C, 3B, 3C, 4B, 4C, 5, mixed conifer 2B, 2C, 3B, 3C, 4B, 4C, 5, white fir 2B, 2C, 3B, 3C, 4B, 4C, 5, red fir 2B, 2C, 3B, 3C, 4B, 4C, 5, plantations (<1"DBH), manzanita, silver sagebrush, western jumper, rabbitbrush
Distance to Cover	<400 yards	400-500 yards	>550 yards
Canopy Closure			
<i>Shrubs</i>	10-40%	<10% or 40-80%	>80%
Trees	<20%	20-40%	>40%
Shrub Age Class	Young	Mature or Seedling	Decadent
Proportion of Area in Forage Stands	50-80%	30-50% or 80-90%	<30% or >90%
Livestock Utilization	Light to no grazing	Moderate to Light	Heavy
Roads	<2.5 mdsq mi	2.5 - 6 m/sq mi	> 6 mdsq mi
Distance Between Water			
General	<2 miles	2-3 miles	>3 miles
Fawning	< 25 miles	< 25 - 1 mile	> 1 mile
Slope	<40%	40-60%	>60%

OSPREY  
SEASON(S) All

LIFESTAGE ALL  
AREA Northern California

HABITAT VARIABLE	HABITAT CAPABILITY		
	(Suitable*)	(Unsuitable*)	
	HIGH (Preferred)	MEDIUM (Required**)	LOW (Marginal)
Vegetation Types and Successional Stage 5/, 6/	ponderosa pine 4A, 5 eastside pme 4A, 5 mured conifer 4A, 5 pme-juniper 4A mured evergreen 4A,B	ponderosa pme or eastside pine 1A, B, C, 2A,B,C, 3A,B,C, 4B,C, pine-juniper 2A,B,C; 3A,B,C, 4B,C, npanan, red fir, lodgepole	other vegetation types (unless artifical platforms are provided)
Water Body, Size	>2000 acres	100-2000 acres	10-100 acres
Nest Tree Condition	broken-topped snag, broken-dead-topped live tree, or platform, super-canopy tree	broken-top live tree, or intact-top snag, super- canopy tree	intact top hve tree
Nest Tree Size	>40" DBH, >125' high	24-40 DBH, 75-135' high	<24" DBH, <75"high
		<b>or</b>	
Perch/Pilot Trees	Platforms placed at least 20 feet above the ground 15 snags >24" DBH wthn 100feet of the water body, mthin the foragmg range,  and an additional 15 trees >24" DBH (snags, broken top live trees) mthin 1/8 mile nest	10 snags >24" DBH mthm 100fet of the water body, wthin the foragmg range,  and an additional 10trees >24" DBH (snags, broken top live trees) wthn 1/8 mile nest	<10 snags, etc  and <10 trees etc
Prey Base	Well-stocked with cold and/or warmwater fish ≥6" long		Low populations of cold or warm water fish, mostly <6" long
Nest Distance from Water	<1/4 mile	1/4- 1 nule	> 1mile
Ice-Free Water	Feeding area mostly ice-free by April 1	Feeding area mostly ice-free by May 1	Feeding area not ice-free by May 1
Disturbance	Foot traffic & logging >1/2 mile from nest, March to August	Foot traffic & loggmg 1/8to 1/2 mile from nest, March to August	Foot traffic & loggmg <1/8 mile from nest, March to August
Pesticide Levels	Very low	Low	Moderate

**PEREGRINE FALCON**

LIFESTAGE ALL

SEASON(S) Spnng and Summer

AREA Northern California

HABITAT VARIABLE	HABITAT CAPABILITY		
	(Suitable*)	(Suitable*)	(Unsuitable*)
	HIGH (Preferred)	MEDIUM (Required**)	LOW (Margmal)
Elevation	<4000'	4000-8000'	>8000'
Cliff Conditions	Vertical faces 75-300 feet high with abundant ledges at least 10sq ft or large deep cliff-faced caves, providing a commanding view		
Food Supply	Abundant and available avian prey wthin 6 miles of nest site Common prey species are band-tailed pigeon, rock dove, mourning dove, common flicker, jays, starlings, robin, western meadowlark, acorn woodpeckers, red-wmged blackbird, cedar waxwing (listed in order of importance)		
Proximity to a major river, lake, or marsh	<1/2 mile	1/2 - 1nule	>1 mile
Disturbance	No disturbance mthm 2 miles of the nest site, March 1 to May 15	Short <del>term</del> disturbance within 1mile of the nest site, March 1 to May 15	Moderate to high disturbance wthin 1 mile of the nest site, March 1 to May 15

PILEATED WOODPECKER

LIFESTAGE ALL

SEASON(S) All

AREA Northern California

HABITAT VARIABLE	HABITAT CAPABILITY		
	(Suitable*)		(Unsuitable*)
	HIGH (Preferred)	MEDIUM (Required**)	LOW (Marginal)
Vegetation Types and Successional Stage 5/1, 6/	mlxed conifer 4B, 4C, 5; coast range montane 4A, B, C	ponderosa pine 4B, 4C, 5 red fir 4B, 4C, 5 ripanan, aspen	eastside pine 4B, 4C, 5 black oak 3C, 4A, 4B blue oak-digger pine 4A, B, C Oregon oak 4A, B, C
Nest sites	snag, live tree (aspen only)	dead portion of live tree	live tree
Nest Tree	>26" DBH, >80' high, broken top, no bark	20-26" DBH, 35-80 high, top intact, no bark	<20" DBH, <35' high, top intact, bark present
Nest Tree Condition	no decay	moderate decay	advanced decay
Snag Densities Around Nest Tree	1-2 acre patch of >8 snags/acre, >20" DBH (3 snags>26" DBH)	1-2 acre patch of 3-8 snags/acre, >20" DBH (2 snags>24" DBH)	1-2 acre patch of <3 snags/acre, >20" DBH
Snag Density Within Territory (Territory = 300 acres)	(See Habitat Capability Model for "Snags")		
Feeding Sites (down logs, snag, live trees)	>25" DBH	18-25 DBH	<18" DBH

**PRONGHORN ANTELOPE**

LIFESTAGE ALL

SEASON(S) All

AREA Northeastern California

HABITAT VARIABLE	HABITAT CAPABILITY		
	HIGH (Preferred)	MEDIUM (Required**)	LOW (Marginal)
Vegetation Types	low sagebrush, big sagebrush, bitterbrush, perennial grass, wet meadow, fresh emergent, wetland, annual grass	western juniper	eastside pine , others
Shrub Age Class			
<i>Summer</i>	young, mature	seedling	decadent
<i>Winter</i>	mature	young, decadent	seedling
Height of Dominant Vegetation	10-20-inches	5-10 mches or 20-30 inches	<5 inches or >30 inches
Shrub Canopy Closure			
<i>Summer</i>	10-30%	<10% or 30-50%	>50 %
<i>Winter</i>	20-50%	10-20% or 50-70%	<10% or >70%
Canopy Closure of Trees	0-10%	10-20%	20%
Percent of Forbs in Ground Cover	10-30%	7-10% or 30-50%	<7%, >50%
Average Distance Between Free Water	<2 mi	2-3 1/2 mi	>3 1/2 mi
Road Density	<2 mi/sq mi	2-4 mi/sq mi	>4 mi/sq mi

**RAINBOW TROUT**  
SEASON(S) All

LIFESTAGE ALL  
AREA Northeastern California

HABITAT VARIABLE	HABITAT CAPABILITY		
	(Suitable*)		(Unsuitable*)
	HIGH (Preferred)	MEDIUM (Required**)	LOW (Marginal)
Average water mdth	8-40 ft	4-8 ft	<4 or >40 ft
Average water depth	> 1 6 ft	4 - 1 6 ft	< 4 ft
Water temperatures	50-61 degrees F	40-50 degrees F or 61-72 degrees F	≤40 or > 72 degrees F
Stream channel stability	>80%	50-80%	<50%
Pool abundance (pool riffle ratio)	40-60%	20-40% or 60-80%	<20% or >80%
Pool characteristics (pool grade)	"A" At least 50% of the pools must be greater than 3 feet deep and have greater than 30% submerged cover	" B At least 20% of the pools must be greater than 6 inches deep and have greater than 20% submerged cover,  or stream sections have continuous deep, slow-movmg water	" C Less than 20% of the pools are greater than 6 inches deep and have greater than 20% submerged cover
Water surface shade (June 1- September 30 10 a m to 4 p m )	70-95%	35-70% or 95-100%	<35%
Spawning area substrate	>80% gravel m nffles, <15% silt cover	25-80% gravel m nffles, 15-25% silt cover	<25% gravel in riffles: >25% silt cover
Average velocity (Aug 1 - Sept 15)	1 3- 2 7 Wsec	8 - 1 3 ft/sec or 2 7 - 3 3 Wsec	< 8 or > 3 3 ft/sec
Aquatic organisms	Abundant >24/sq ft	Common 10-24/sq ft	Few <10/sq ft
Disturbance to stream habitat			
<i>Spring spawners</i>	Disturbance allowed Aug 15-Sept 15	Disturbance allowed July 15-Aug 15 or Sept 15-Oct 30 (weather permitting)	Any other time of the year
<i>Sprang and fall spawners</i>	Disturbance allowed Aug 1-31	Disturbance allowed June 15-July 31 or Sept 1-Oct 15	Any other time of the year
<i>Fall spawners</i>	Disturbance allowed June 1- Sept 15	Disturbance allowed May 15-May 31 or Sept 15-Oct 1	Any other time of the year

SPOTTED OWL  
 (Northern and California Subspecies)  
 SEASON(S). All

LIFESTAGE ALL

AREA Northern California

HABITAT VARIABLE	HABITAT CAPABILITY		
	(Suitable*)		(Unsuitable*)
	HIGH (Preferred)	MEDIUM (Required**)	LOW (Marginal)
Vegetation Type	mixed conifer	ponderosa pine, red fir, aspen, npanan	subalpine forest
Successional Stages 5/, 6/	5, 4C	5, 4C	<b>4B, 3B, 3C, 2C</b>
Stand Structure	Multi-layered stand with moderate to abundant understory trees and/or shrubs, moderate to abundant decadence in stand		Single dominant size class, sparse to no sub- canopy tree layer, sparse to no under- story, little to no decadence in stand
Proximity to Stream or Springs	< 1/4 mile	1/4-3/4 mile	>3/4 mile
Nest Stand	>500 acres	300-500 acres	<300 acres
Disturbance	No logging, OHV use, or other major disturbance in the nest stand, April 1 to July 30		



**STEELHEAD TROUT AND  
CHINOOK SALMON**

LIFE STAGE Adult (migration)

SEASON(S) Winter and Spnng

AREA Northern California

HABITAT VARIABLE	HABITAT CAPABILITY		
	(Sutable*)	(Unsutable*)	
	HIGH (Preferred)	MEDIUM (Required**)	LOW (Marginal)
Temperature			
<i>Chinook Salmon - Fall</i>	51-60 degrees F	60-67 degrees F	>67 or <51 degrees F
<i>Chinook Salmon - Spring</i>	38-50 degrees F	50-56 degrees F	<38 or >56 degrees F
<i>Steelhead - Winter</i>	40-50 degrees F	50-56 degrees F	<40 or >56 degrees F
Dissolved Oxygen	>80% saturation	80% saturation	<80% saturation
Turbidity	0-10 NTU's	11-19 NTU's	>20 NTU's
Waterfall Height	No waterfalls	<6 feet	>6 feet
Water Velocities	0-4 fffsec	4-9 Wsec	>9 Wsec
Water Depth	>2 ft	1-2 ft	<1 ft
Pool Abundance (Pool Riffle Ratio)	40-60%	20-40% or 60-80%	<20% or >80%
Cover	>80%	60-80%	<60%
Temperature			
<i>Chinook Salmon</i>	45-53 degrees F	42-45 degrees F or 54-57 degrees F	<42 degrees F or >57 degrees F
<i>Steelhead</i>	41-47 degrees F	39-40 degrees F or 48-49 degrees F	<39 degrees F or >49 degrees F
Substrate	0-10% fines (<3 35mm)	10-15% fines	15-20% fines
Water Depth			
<i>Chinook Salmon - Fall</i>	5 - 2 0 ft	4- 5 ft or 2 0-3 0 ft	< 4 it or >3 0 ft
<i>Chinook Salmon - Spring</i>	5 - 1 0 ft	1 0 - 2 0 ft	< 5 ft or > 2 0 ft
<i>Steelhead - Winter</i>	5 - 2 0 ft	3 - 5 ft or 2 0 - 3 0 ft	< 3 ft or > 3 0 ft
Velocity			
<i>Chinook Salmon - Fall</i>	1-2 Wsec	5-1 ft/sec or 2-3 5 fffsec	< 5 Wsec or >3 5 Wsec
<i>Chinook Salmon - Spring</i>	1-2 ft/sec	<1 fffsec or 2-3 Wsec	>3 fffsec
<i>Steelhead - Winter</i>	1-2 Wsec	3-1 fffsec or 2-3 ft/sec	>3 fffsec
Dissolved Oxygen	>8 ppm	5-8 ppm	<5 ppm

**STEELHEAD TROUT AND  
CHINOOK SALMON (continued)**  
SEASON(S). All

LIFE STAGE Juvenile

AREA. Northern California

HABITAT VARIABLE	HABITAT CAPABILITY		
	(Suitable*)	(Suitable*)	(Unsuitable*)
	HIGH (Preferred)	MEDIUM (Required**)	LOW (Marginal)
Water Velocities	80-100% of the riffles with velocities between .5 and 3.5 Wsec	60-80% of the riffles with velocities between .5 and 3.5 ft/sec	<60% of the riffles with velocities between .5 and 3.5 Wsec
Water Depth	80-100% of the stream .5 to 3.0 feet deep	60-80% of the stream .5 to 3.0 feet deep	<60% of the stream .5 to 3.0 feet deep
Substrate	>60% of the stream composed of coarse gravel 1.2-2.9 inches and rubble between 2.9 and 11.8 inches	40-60% of the stream composed of coarse gravel 1.2-2.9 inches and rubble between 2.9 and 11.8 inches	<40% of the stream composed of coarse gravel 1.2-2.9 inches and rubble between 2.9 and 11.8 inches
Temperature			
<i>Steelhead</i>	45-50 degrees F	51-58 degrees F	<45 degrees or >58 degrees F
<i>Chinook Salmon</i>	45-54 degrees F	55-59 degrees F	<45 degrees or >59 degrees F
Dissolved Oxygen	>7 ppm	4-7 ppm	<4 ppm
Turbidity	0-10 NTU's	11-19 NTUs	>20 NTUs
Cover	80-100% of the stream having suitable cover	60-80% of the stream having suitable cover	<60% of the stream having suitable cover
Streamflow	Flow sufficient to provide near 50:50 pool/riffle ratio, 60-100% of riffle covered with water riffle velocities 1.0-1.5 ft/sec, pool velocities of 3 to 8 ft/sec	Flow sufficient to provide near 40-60% pools, 40-60% of riffle covered with water riffle velocities .5-1.0 or 1.5-2.0 ft/sec, pool velocities of 1-3 or 8 to 10 ft/sec	Flow providing <40% or >60% pools, <40% of riffle covered with water, riffle velocities < 5 Wsec, pool velocities of less than 1 ft/sec or more than 10 Wsec

**WESTERN GRAY SQUIRREL**

LIFESTAGE ALL

SEASON(S). All

AREA. Northwestern California

HABITAT VARIABLE	HABITAT CAPABILITY		
	(Suitable*)	(Suitable*)	(Unsuitable*)
	HIGH (Preferred)	MEDIUM (Required**)	LOW (Marginal)
Vegetation Types and Successional Stages <b>5/</b> , <b>6/</b>	black <i>oak</i> woodland 3B, 4A, 4B	black <i>oak</i> woodland 3A	black oak woodland <b>2</b>
	blue <i>oak</i> savannah 3B, 4A, 4B	blue oak savannah 3A	blue <b>oak</b> savannah <b>2</b>
	digger-pine <i>oak</i> 3B, <b>4A</b> , <b>4B</b>	digger-pine <i>oak</i> 3A	digger-pine oak <b>2</b>
	Oregon white oak 3B, 4A, 4B	Oregon white oak 3A	Oregon white oak <b>2</b>
	mixed conifer 4A, 4B, 4c	mixed conifer 3A, 3B, <b>3C</b>	mixed conifer <b>2</b>
Den Tree	≥15 mches	215 inches	515 mches
<b>Minimum</b> Nesting Height	≥ 15ft	≥15 <b>R.</b>	≤ 15 ft.
Other	Oak species required for permanent populations, age classes should be well distributed, fungi and acorns are year-round foods.		

HABITAT VARIABLE	HABITAT CAPABILITY		
	(Suitable*)	(Required**)	(Unsuitable*)
	HIGH (Preferred)	MEDIUM (Required**)	LOW (Marginal)
<b><u>MONTANE CONIFER 2/</u></b>			
Average Density			
15-24" DBH	>3 0/acre	12 - 3 0/acre	<1.2/acre
>24" DBH	>.05/acre	0 3-0 5/acre	<0 3/acre
<b>Total</b>	>3 5/acre (Max = 10/acre)	15 - 3 5/acre (Max = 5/acre)	<1.5/acre (Max = 3/acre)
Height	>40 feet	20-40 feet	<20 feet
Dispersion	one group per 5 acres or less with <b>15+</b> snags	one group per 5-15 acres or less with 5-15+ snags	even chspersion
Hard:Soft Ratio	> 3 1	2 1 - 3 1	<2 1
Location	edges of meadows, brushfields, streams, and other water	throughout wooded stands	rocky, open slopes, barren
Species	white fir, Douglas fir, lodgepole pme, black oak, mt hemlock	ponderosa pme, Jeffrey pine, sugar pme, incense cedar, red <b>fir</b> , tan oak, madrone	whitebark pine
<b><u>CONIFERS AND HARDWOOD WOODLANDS 3/</u></b>			
Average Density			
15-24" DBH	>2.0/acre	0.8-2.0/acre	<0 8/acre
>24" DBH	> 05/acre	0.2-0 5/acre	<0.2/acre
<b>Total</b>	>2 5/acre (Max = 10/acre)	1 0-2.5/acre (Max = 5/acre)	<1.0/acre (Max = 3/acre)
Height	>40 ft	20-40 ft.	<20 R
Dispersion	Combation of clumps (3-6 snags/acre) and even chspersion	Even chspersion	
Hard:Soft Ratio	>3:1	2 1 - 3 1	<2 1
Location	edges of meadows, brushfields, streams and other water	throughout wooded stands	barren areas
Species	digger pme, ponderosa pine, Jeffrey pme, jumper pine, blue oak, black oak	wh te oak, tan oak, live oak	

**SNAGS 1/ (continued)**

AREA Northeastern California

HABITAT VARIABLE	HABITAT CAPABILITY		
	(Suitable*)	(Unsuitable*)	
	HIGH (Preferred)	MEDIUM (Required**)	LOW (Marginal)
<b><u>RIPARIAN 4/, ASPEN</u></b>			
Average Density			
15-24" DBH	>3.6/acre	14-36/acre	<1.4/acre
>24" DBH	>0.6/acre	0.2-0.6/acre	<0.2/acre
Total	>4.2/acre (Max = 10/acre)	1.6-4.2/acre (Max = 5/acre)	<1.6/acre (Max = 3/acre)
Height	>40 ft	20-40 ft.	<20 ft
Dispersion	combination of clumps (5-10 snags/acre) and even dispersion	even dispersion	
Hard Soft Ratio	>3.1	2.1-3.1	<2.1
Species	aspen, cottonwood	alder, conifers	willow

\* Suitability refers to the appropriateness of applying habitat management practices to improve capability, or of placing management emphasis on the stated habitat conditions

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

1/ Green culls can be substituted for snags down to the level of at least one remaining snag/acre. A green cull is defined as being at least 30 feet tall and having at least one of the following characteristics: Spike top (the top 1/4 of the tree is dead), broken top, large dead limbs, existing cantles, or defects in the bowl that could become cavities.

2/ Includes ponderosa pine, mired conifer, lodgepole pine, red fir, subalpine forest, eastside pine, Jeffrey pine, coast range montane, mixed evergreen, and black oak (Verner and Boss 1980, Laundeslayer 1980, Marcot 1979)

3/ Includes blue oak savanna, white oak, Oregon oak, digger pine/oak, and pine-juniper WHR types (Verner and Boss 1980, Laundeslayer 1980, Marcot 1979)

4/ The riparian area includes areas within a horizontal distance of 100 feet from the edge of streams (FSM 2526 05)

5/ Seral stages                      Height Range

grass/forb	1=	0-2 ft
seedling/sapling	2=	<20 ft
pole/medium	3=	20-50 ft
large tree	4=	>50 ft
multi-layer trees	5=	>50 ft

6/ Canopy Closure Class

Timber Class	WHR Class	Percent Closure
S=	A=	<20%
P=	A=	20-39%
N=	B=	40-69%
G=	C=	70 + %

# APPENDIX P - PROJECT PLANNING AND IMPLEMENTATION PROCESS

This appendix summarizes the planning and implementation process for resource projects such as timber sales, mineral development, recreation site construction, and range improvements

Project planning involves a series of activities that begins with need identification and ends with project implementation through contract award or other means. The objectives of the project planning process are to give full consideration to possible alternatives, ascertain probable environmental effects, and design feasible resource protection measures. Project implementation is simply achieving the proposed action in the manner identified in the planning.

## Activities

Each activity, listed below in order of occurrence, must result in a specific output before the next activity is begun:

<u>Activity</u>	<u>Output</u>
1. Project proposal development	Project Proposal
2. Environmental analysis	Appropriate documentation.
3. Project design and layout	Project report and on the ground design or layout.
4. Project execution	Project implementation or contract offering, project administration, and evaluation

## Description of Activities

In brief, the four activities above consist of the following

1. Project proposal development involves describing the project area, gathering known information; determining issues, opportunities, and probable outputs, and estimating skills and resources needed for project design and layout.

2. Environmental analysis is an interdisciplinary process for exploring project alternatives, effects, and mitigation measures. The depth of analysis depends on the complexity of the project. The results are documented in either an environmental assessment (EA) and decision notice/finding of no significant impact, an environmental impact statement (EIS) and record of decision, or a categorical exclusion and decision memo.

3. Project design and *layout* involves transferring the selected alternative to the ground. This includes such steps as recreation site survey and design, silvicultural prescriptions, timber harvest designation, road surveys and design, and streamside buffer-zone boundary marking.

4. Project *execution* includes such steps as timber sale appraisal and contract development, construction or service contract preparation, or project planning for work to be done by Forest Service crews. This is followed by actual implementation, which requires appropriate project administration and evaluation to insure that design and mitigation requirements are met.

**Time Frame** Projects vary significantly in complexity and environmental impact. Planning a livestock water tank may take a few days, while a timber sale involving steep slopes and major road construction may be in the planning process for eight years or more.

# APPENDIX Q - WATER QUALITY MANAGEMENT — BEST MANAGEMENT PRACTICES AND PROCESS

## Introduction

The Forest Service water quality maintenance and improvement measures, called Best Management Practices (BMP's), were developed in compliance with Section 208 of the Federal Clean Water Act, PL92-500, as amended. After a lengthy development and a public review process from 1977 to 1979, the practices developed by the Forest Service were certified by the State Water Resources Control Board and approved by EPA. The signing of a 1981 Management Agency Agreement (MAA) resulted in the formal designation of the Forest Service as the water quality management agency for the public domain lands it administers. The BMP's are the measures both the State and Federal Water quality regulatory agencies expect the Forest Service to implement to meet water quality objectives and to maintain and improve water quality.

There are currently 96 practices documented, which are certified and approved as BMP's, plus three which are pending state approval (practices 3-1, 5-5, and 7-8. See the following list). Two additional practices are being considered - "Control of Road Maintenance Chemicals" and "Sanitary and Erosion Control at Temporary Camps." Work continues on developing new management practices and evaluating the effectiveness of the existing BMP's. Due to the dynamic nature of management practice development and refinement, the original Forest Service publication documenting BMP's is continually being updated. The current publication reference is Water Quality Management for National Forest System Lands in California, U.S. Forest Service, Pacific Southwest Region publication, 1979. This publication is hereby incorporated by reference into this document. Work is underway to republish the updated version of this text as a Soil and Water Conservation Handbook. Water quality management is administered on National Forest lands through the continued implementation of BMP's and through the guidance of a 1981 Management Agency Agreement with the State of California Water Resources Control Board.

## Implementation Process

Forest Plans are broad level planning documents that encompass the entire Forest and a multitude of different management activities. Because of the physical-biological diversity of any given National Forest (different soils, vegetation, slopes, presence of surface water, etc.) and the mixture of activities that can occur on various portions of the Forest, site specific methods and techniques for implementing the BMP's are not identified at the Forest Planning level. For each individual project that is initiated to implement the Forest Plan, a separate site specific environmental assessment is conducted. The appropriate BMP's necessary to protect or improve water quality and the methods and techniques of implementing the BMP's are identified at the time of this onsite, project specific assessment. In this manner the methods and techniques can be tailored to fit the specific physical-biological environment as well as the proposed project activities.

There are commonly many methods available for implementing a BMP, and not all are applicable to every site. An example is BMP 2.7 Control of Road Drainage. This BMP dictates that roads will be correctly drained to disperse water runoff to minimize the erosive effects of concentrated water. There are many ways to drain a road correctly; e.g., outslope the road surface, install water bars, install French Drains, inslope the road surface, install culverts, etc. It is during the onsite environmental assessment of a specific road construction project proposal that the appropriate method or combination of methods to correctly drain the road are identified.

After the methods and techniques of implementing the appropriate BMP's are identified, they are discussed by the project interdisciplinary team. As a result of discussions, the appropriate mix of implementation methods and techniques are selected and incorporated into the environmental document as required mitigation measures. These mitigation measures are then carried forward into project plans and imple-

mentation documents; e.g., contract language, design specifications, etc. to assure they are part of the project work accomplished. Implementation on the ground is assured by the Forest Service official responsible for on-site administration of the project. Supervisory quality control of BMP implementation is attained through renew of environmental assessments and contracts, field reviews of projects, and monitoring the quality of the water in the project area when warranted.

## The Best Management Practices

There are 99 Best Management Practices organized in eight resource categories. They are as follows, preceded by the practice number:

### Timber

- 1.1 Timber Sale Planning Process
- 1.2 Timber Harvest Unit Design
- 1.3 Use of Erosion Hazard Rating for Timber Harvest Unit Design
- 1.4 Use of Sale Area Maps for Designating Water Quality Protection Needs
- 1.5 Limiting Operating Period of Timber Sale Activities
- 1.6 Protection of Unstable Areas
- 1.7 Prescribing the Size and Shape of Clearcuts
- 1.8 Streamside Management Zone Designation
- 1.9 Determining Tractor Loggable Ground
- 1.10 Tractor Skidding Design
- 1.11 Suspended Log Yarding in Timber Harvesting
- 1.12 Log Landing Location
- 1.13 Erosion Prevention and Control Measures During Timber Sale Operations
- 1.14 Special Erosion Prevention Measures on Disturbed Land
- 1.15 Revegetation of Areas Disturbed by Harvest Activities
- 1.16 Log Landmg Erosion Prevention and Control
- 1.17 Erosion Control on Slud Trails
- 1.18 Meadow Protection During Timber Harvesting
- 1.19 Streamcourse Protection
- 1.20 Erosion Control Structure Maintenance
- 1.21 Acceptance of Timber Sale Erosion Con-

- 1.22 trol Measures Before Sale Closure
- 1.23 Slash Treatment in Sensitive Areas
- 1.24 Five-Year Reforestation Requirement
- 1.25 Non-recumng "C" Provision That Can Be Used For Water Quality Protection
- 1.25 Modification of the Timber Sale Contract

### Road and Building Site Construction

- 2.1 General Guidelines for the Location and Design of Roads
- 2.2 Erosion Control Plan
- 2.3 Timing of Construction Activities
- 2.4 Road Slope Stabdization (Preventive Practice)
- 2.5 Road Slope Stabilization (Administrative Practice)
- 2.6 Dispersion of Subsurface Drainage from Cut and Fill Slopes
- 2.7 Control of Road Drainage
- 2.8 Constraints Related to Pioneer Road Construction
- 2.9 Timely Erosion Control Measures on Incomplete Road and Streamcrossing Projects
- 2.10 Construction of Stable Embankments
- 2.11 Minimization of Sidecast Matenal
- 2.12 Servicing and Refueling Equipment
- 2.13 Control of Construction in Streamside Management Zones
- 2.14 Controlling In-Channel Excavation
- 2.15 Diversion of Flows Around Construction Sites
- 2.16 Streamcrossings on Temporary Roads
- 2.17 Bndge and Culvert Installation
- 2.18 Regulation of Streamside Gravel Borrow Areas
- 2.19 Disposal of Right-of-way and Roadside Debris
- 2.20 Specifying Riprap Composition
- 2.21 Water Source Development Consistent with Water Quality Protection
- 2.22 Maintenance of Roads
- 2.23 Road Surface Treatment to Prevent Loss of Matenals
- 2.24 Traffic Control During Wet Penods
- 2.25 Snow Removal Controls to Avoid Resource Damage
- 2.27 Restoration of Borrow Pits and Quarries
- 2.28 Surface Erosion Control at Facility Sites



## ***Mining***

- 3.1 Water Resources Protection on Locatable Minerals Operations-pending state approval
- 3.2 Administennng Terms of BLM Issued Permits or Leases for Mineral Exploration and Extraction on National Forest System Lands
- 3.3 **Administering Common Variety Mineral Removal Permits**

## ***Recreation***

- 4.1 Sampling and Surveillance of Designated Swimming Sites
- 4.2 On-site Multidisciplinary Sanitary Surveys Will Be Conducted to Augment the Sampling of Swimming Waters
- 4.3 Provide Safe Drinking Water Supplies
- 4.4 Documentation of Water Quality Data
- 4.5 Control of Sanitation Facilities
- 4.6 Control of Refuse Disposal
- 4.7 Assuring that Organizational Camps Have Proper Sanitation and Water Supply Facilities
- 4.8 Water Quality Monitoring Off-Highway Vehicle Use According to a Developed Plan
- 4.9 Sanitation at Hydrants and Faucets Within Developed Recreation Sites
- 4.10 Protection of Water Quality Within Developed and Dispersed Recreation Areas
- 4.11 Location of Pack and Riding Stock Facilities in Wilderness, Primitive, and Wilderness Study Areas

## ***Vegetative Manipulation***

- 5.1 Seed Drilling on the Contour
- 5.2 Slope Limitations for Tractor Operation
- 5.3 Tractor Operation Excluded from Wetlands and Meadows
- 5.4 Revegetation of Surface Disturbed Areas
- 5.5 Tractor Windrowing on the Contour - pending state approval
- 5.6 Soil Moisture Limitations for Tractor Operation
- 5.7 Contour Disking
- 5.8 Pesticide Use Planning Process
- 5.9 Apply Pesticide According to Label and EPA Registration Directions

- 5.10 Pesticide Application Monitoring and Evaluation
- 5.11 Pesticide Spill Contmgency Plan
- 5.12 Cleaning and Disposal of Pesticide Containers and Equipment
- 5.13 **Untreated Buffer Strips for Riparian Area and Streamside Management Zone (SMZ) Protection During Pesticide Spraying**
- 5.14 Controlling Pesticide Drift During Spray Application

## ***Fire Suppression and Fuels Management***

- 6.1 Fire and Fuel Management Activities
- 6.2 Consideration of Water Quality in Formulating Fire Prescriptions
- 6.3 Protection of Water Quality from Prescribed Burning Effects
- 6.4 **Minimizing Watershed Damage from Fire Suppression Effects**
- 6.5 Repair or Stabilization of Fire Suppression Related Watershed Damage
- 6.6 Emergency Rehabilitation of Watersheds Following Wildfires

## ***Watershed Management***

- 7.1 Watershed Restoration
- 7.2 Conduct Floodplain Hazard Analysis and Evaluation
- 7.3 Protection of Wetlands
- 7.4 Oil and Hazardous Substance Spill Contingency Plan
- 7.5 Control of Actiwties Under Special Use Permit
- 7.6 Water Quality Monitoring
- 7.7 Management by Closure to Use (Seasonal, Temporary, and Permanent)
- 7.8 Cumulative Off-Site Watershed Effects Analysis (CWE) - pending State approval

## ***Grazing***

- 8.1 Range Analysis, Allotment Management Plan, Grazing Permit System, and Permittee Operating Plan
- 8.2 Controlling Livestock Numbers and Season of Use
- 8.3 **Controlling Livestock Distribution Within Allotments**
- 8.4 Rangeland Improvements

# APPENDIX R - STREAMSIDE MANAGEMENT ZONE (SMZ) GUIDELINES

This table gives width for the streamside management zone (SMZ) for different stream variables, class, stability, and type of stream. The SMZ widths are slope distances in feet from the top of banks or from a high water line, measured on each *side* of a stream.

Stream Class 1/	Stability 1/		Type of Stream		
	Channel	Adjacent	Perennial 2/	Intermittent 3/	Ephemeral 3/
<b>I Highly Significant</b>	Stable	Stable	200	100-200	NA
	Stable	Unstable	250	150-200	NA
	Unstable	Stable	250	150-200	NA
	Unstable	Unstable	300	200-300	NA
<b>II Significant</b>	Stable	Stable	100	50-100	NA
	Stable	Unstable	150	100-150	NA
	Unstable	Stable	150	100-150	NA
	Unstable	Unstable	200	150-200	NA
<b>III Moderately Significant</b>	Stable	Stable	100	50	NA
	Stable	Unstable	100	100	NA
	Unstable	Stable	100	50	NA
	Unstable	Unstable	100	100	NA
<b>IV Minor Significance</b>	Stable	Stable	Not	50	50
	Stable	Unstable	Applicable	50	50
	Unstable	Stable	Not	50	50
	Unstable	Unstable	Applicable	50	50

1/ See Region 5 Forest Service Handbook 2509.22

2/ Along perennial streams with sideslopes steeper than 50 percent, SMZ distance should be the greater distance from (1) tabulated SMZ distance as horizontal distance, or (2) the distance to the first major slope break. That is, where streams flow through steep-walled canyons or are deeply-incised, SMZ width may exceed distances shown in the table and include the entire inner valley gorge area. The Forest Hydrologist is responsible for specifying the correct SMZ distance for perennial streams in project areas.

3/ Along ephemeral and intermittent streams with sideslopes steeper than 50 percent, adjust slope distances to achieve the tabulated SMZ distances as horizontal distances.

# APPENDIX S - SPOTTED OWL HABITAT MANAGEMENT

## Introduction

The purpose of this appendix is to describe the planning framework used by the Lassen National Forest for management of Spotted Owl Habitat Areas (SOHA's) for the California spotted owl. The primary purpose of spotted owl habitat management is to maintain a viable population of the species on the Lassen National Forest and throughout its historical range within the Region.

## Planned Habitat Capability

Following Regional guidelines, the number of SOHA's necessary to promote a viable population for the California spotted owl on the Lassen National Forest is 39. The adopted Plan designates 40 SOHA's for the California spotted owl.

The area north of Highway 299 is considered within the range of the northern spotted owl. The narrow corridor between the Lassen National Forest and the Shasta-Trinity National Forest in this area was included in the study by the Interagency Scientific Committee to Address the Conservation of the Northern Spotted Owl (ISC). The Committee was asked to develop a scientifically credible conservation strategy for the northern spotted owl in Washington, Oregon, and the Klamath Province of northern California. In April 1990, the Committee recommended the creation of Habitat Conservation Areas (HCA). One HCA, comprising a total of 9,548 acres, is located on a portion of Shasta National Forest that is administered by the Lassen. Two former SOHA's are within the HCA, and one is located outside, but still within the area of study by the ISC. These three areas are no longer being managed as SOHA's. Recommendations contained within the ISC Report will be followed pending the adoption of a recovery plan by the U.S. Fish and Wildlife Service, the enactment of new legislation, any applicable action by the Endangered Species Committee, or

the results of further biological consultation. The 50-11-40 rule will be adopted for areas adjacent to the HCA within the range of the northern spotted owl. Under this rule, 50 percent of the land outside the HCA will be managed to maintain timber stands with an average 11 inch dbh and 40 percent canopy closure.

Although the rest of the Forest south of Highway 299 is not within the Klamath Province, the Committee's report raised serious questions about the establishment of SOHA networks to maintain population viability for the northern spotted owl. Because the SOHA concept has also been used for the California spotted owl, the report may have implications on how the Lassen National Forest manages this species. At present, an interagency task force has been established to evaluate other management options in place of SOHA networks. Vegetative management activities within suitable California spotted owl habitat will be evaluated for cumulative effects on existing owl populations until management direction is determined.

## Habitat Needs

Spotted owl habitat is characterized by mature and overmature, multi-layered stands with moderate to abundant understory of trees and shrubs, and moderate to abundant decadence. The characteristics, spatial arrangement, and size of timber stands within the SOHA's are critical to the survival of the spotted owl. Appendix H of the *Final Environmental Impact Statement for the Pacific Southwest Regional Guide* (1984) specifies that habitat managed for spotted owls must exist within an area no larger than 4,500 acres, which is equivalent to a circle of 1-1/2 mile radius around a core or nesting area. Appendix H further specifies that within a 4,500 acre SOHA, 1,000 acres of base habitat and 650 acres of replacement habitat are needed at all times to maintain one viable pair of owls. <sup>1/</sup>

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<sup>1/</sup> Definitions of suitable habitat and a description of the spatial arrangement needed for this habitat can be found in Appendix H of the *Final Environmental Impact Statement for the Pacific Southwest Regional Guide* (1984).

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In December 1982, the Forest identified the location of 39 SOHA's that best met the Regional requirements for an owl network to maintain species viability while minimizing the impact on other Forest goals. The SOHA network was based on several factors: (1) the presence of owls or suitable habitat, (2) proper distribution as defined in Regional direction, (3) the presence of amounts of owl habitat that most closely met the 1,000 acre guideline for suitable base habitat and 650 acres of replacement habitat, and (4) the lack of conflict with active timber sales.

As a result of a 1991 survey, 191 adult owls were located on the Forest. One is within the range of the northern spotted owl; the others are California spotted owls. Of these, 87 are paired. There were 17 reproducing pairs in 1990 on the Forest and 36 in 1991. Within the SOHA network since 1985, we have recorded 24 sites with reproduction, 19 others had occupancy, three had presence, and seven SOHA's have recorded more than one pair of owls. 1/

The current amounts of suitable habitat in the Forest's SOHA network are below the population viability standards set forth in the Regional Guide. Of the 40,000 acres designated as base spotted owl habitat, 27,153 acres (or 68 percent) are suitable; 32 percent do not contain the vegetative conditions necessary to maintain population Viability at this time. All SOHA's will have the required acres of suitable habitat within the next three to five decades.

## Distribution of Habitat

The appropriate distribution of these SOHA's throughout the Forest was designed by the Forest Wildlife Biologist to allow for continued dispersion and random interchange between members of the population. Thirty-two SOHA's are within a mile of at least one other SOHA. Table S-1 shows the SOHA numbers by Ranger District.

**Table S-1**

### Spotted Owl Habitat Area Number By Ranger District

Ranger District	SOHA Number
Almanor	1, 3, 5, 7, 9, 11, 13, 15, 17, 33, 35, 39, 41, 45, 47, 49, 51, 53, 55, 97, 99
Eagle Lake	19, 21, 23, 25, 27, 29, 37, 85
Hat Creek	57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 79

## Management Methods

A SOHA can be managed using any one or any combination of three silvicultural methods. Appendix H of the *Final Environmental Impact Statement for the Pacific Southwest Regional Guide (1984)* describes these methods as even-aged timber management, uneven-aged timber management, and no scheduled timber harvest. Under the Plan, there will be no scheduled timber harvest within SOHA's on the Lassen National Forest. Annual yields from the SOHA network and HCA would equate to approximately 27 MMBF if harvesting occurred.

Salvage activities may be appropriate in certain circumstances to remove heavy concentrations of insect or drought-killed timber, and protect stands against catastrophic wildfire losses. If timber harvesting (with the exception of salvage) or other projects are planned within SOHA's, or might affect SOHA owls or their habitat, a Spotted Owl Management Plan will be prepared. SOHA Management Plans provide a scientific analysis of the purpose and need for the project and any mitigation measures required to insure that species viability will not be compromised. No timber harvesting will occur inside SOHA's unless the Spotted Owl Management Plan determines that timber management will maintain or enhance the quality of habitat within them.

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1/ A SOHA has occupancy when a non-reproducing owl pair has been recorded. A SOHA has presence when a single owl is found.

The L Prescription will be followed for leaving the required number of snags and down material

Because the present SOHA network does not contain the required acres of suitable habitat, as now defined to maintain population viability, the Forest developed a management strategy to protect non-network owls. Under this strategy, an additional 125 acres will be protected for each non-network pair of owls inventoried. This 125 acres size delineation was developed from the standards and guides in the ISC Report for

known pairs of owls outside of HCA's. The report recommends 80 acres or a 1/4 mile radius circle (125 acres) for these pairs. The Forest agreed that 125 acres for known pairs outside of SOHA's would provide for minimal nesting habitat and the opportunity for dispersal into the SOHA network. If a single owl is found, 126 acres will be protected for up to two field seasons to allow enough time for biologists to determine the status of the bird. Management of non-network owls will continue until there is a reproducing pair in each SOHA in the network, an estimated three to five decades from now

# APPENDIX T - FURBEARER MANAGEMENT

## Introduction

This appendix describes the assumptions and procedures used by the Lassen National Forest to model marten and fisher management. The maintenance of viable populations of all native vertebrate species is mandated under the National Forest Management Act and its interpreting regulations found in Section 219.19 of the Code of Federal Regulations. Both marten and fisher are Management Indicator Species (MIS) on the Lassen National Forest. They represent species that prefer habitat conditions with late successional stage vegetation. These two species are also listed as Sensitive by the Regional Forester.

The management objective for marten and fisher is to maintain and enhance their populations where possible, to insure they do not become federally listed as Threatened or Endangered. Suitable marten and fisher habitat was identified based on the latest scientific knowledge as summarized in a comprehensive regional literature review.

Habitat management areas (HMA's) were established using these guidelines to 1) determine approximate locations of territories; 2) determine the effects of these territories on timber management objectives and; 3) develop recommendations for marten and fisher habitat distribution on the Forest.

## Assumptions

- 1) Marten and fisher habitat was mapped to obtain a moderate habitat capability so that each breeding pair can reproduce, and provide at least two offspring to the gene pool. Each habitat area can support one male and two females.
- 2) Habitat was identified to provide breeding areas and travel corridors to facilitate movement of individuals and ge-

netic interchange throughout the length of the Forest.

- 3) Habitat was located on lands where there have been historical sightings of these species. In addition, a secondary objective in identifying marten and fisher habitat areas and travel corridors was to locate them on lands already withdrawn from full timber management to the extent feasible. These include wildernesses, Research Natural Areas, Special Interest Areas, Wild and Scenic River corridors, Spotted Owl Habitat Areas, goshawk territories, riparian areas, semi-primitive areas, and some visual areas. This minimizes the effect marten and fisher management would have on other resource objectives.
- 4) All components of the habitat would be met within an area of approximately 2,100 acres for marten and 9,800 acres for fisher. All habitat areas are connected by travel corridors based on the latest scientific knowledge for spacing and width.
- 5) Red fir, white fir, mixed conifer and lodgepole pine were all considered suitable vegetation communities for fisher and marten.

## Habitat Needs and Distribution

The majority of marten and fisher habitat is located along the western half of the Forest in mature, mixed conifer stands with dense crown canopy closures. In total, 93,900 acres on the Forest have been identified as marten and fisher habitat management areas. This includes home range and travel corridors. At this time, HMA's have only been tentatively located on the Forest. HMA's will be firmly identified by December 1992, pending additional management direction and field review of tentatively selected areas.

Under the moderate habitat capability model, the home range for fisher comprises 9,800 acres. Habitat areas are spaced 3 to 8 miles apart. Travel corridors between the areas are 600 feet wide. These areas are continuous blocks of land with a majority of the area comprised of well stocked, large sawtimber (3G and 4G), and old growth stands. Five fisher habitat areas were identified on the Lassen National Forest totaling 63,500 acres. Two of these areas also overlap with four marten areas.

Marten requirements under the moderate habitat capability model call for 2,100 acres of home range with a minimum stand size of 80 acres. Again, large sawtimber and old growth stands were considered suitable for marten habitat. Management areas are spaced approximately three miles apart with an average corridor width of 600 feet to provide a travelway to other areas. The travel corridors are generally located along riparian zones. A total of 19 management areas were established on the Forest for marten comprising 30,400 acres.

Marten and fisher habitat management areas and travel corridors will receive a no scheduled timber harvest prescription. Because the marten and fisher management areas are located primarily on lands already withdrawn from full timber management, the total number of acres which are dedicated solely to these species is 24,800. Under FORPLAN modeling, annual yields from HMA's would equate to about 7 MMBF if timber harvesting occurred.

Salvage activities may be appropriate in certain circumstances to remove heavy concentrations of insect or drought killed timber, and protect stands against catastrophic wildfire losses. No timber harvesting will occur unless a biological evaluation and NEPA analysis determines that timber management (salvage) will maintain or enhance the quality of habitat for these species. The L Prescription will be followed for leaving the required number of snags and down material.

Marten and fisher habitat will be managed under a no scheduled harvest prescription for the following reasons:

- 1) At this time, we do not have specific information on what habitat conditions currently exist on the Lassen National Forest that contribute toward the maintenance of viable populations of the species. Until this information becomes available, it is necessary to preserve our management options to maintain species viability. Also, the Lassen National Forest only contributes to population viability for marten and fisher. Because their habitat needs are greater than the Lassen can provide, our habitat areas will be linked with adjacent National Forests. Future management activities to provide for viability will be coordinated with those Forests.
- 2) Based on existing information, we have limited suitable furbearer habitat on the Forest right now. Existing habitat is being fragmented by continued logging and, in most instances, no longer meets the medium habitat capability for marten and fisher. At our current rate of harvest, suitable habitat to maintain population viability will be jeopardized. Using the Regional Office's literature review as a guide, 33 percent of our furbearer areas are deficit in suitable habitat and do not meet the medium habitat capability model defined by this review. We recommend a policy of no scheduled harvest until suitable habitat is available.
- 3) Currently, there is no research data or other empirical evidence to suggest that we can harvest within furbearer areas and still maintain suitable habitat conditions. Until there is additional research, we do not recommend any silvicultural treatments other than incidental removal of salvage volume.

# APPENDIX U – SERAL STAGE CODES FOR WILDLIFE HABITAT RELATIONSHIPS\*

Each Wildlife Habitat Relationship (WHR) code for forested lands is briefly described as follows.

<i>Code</i>	<i>Definition</i>
1	Barren/grass/forbs
2	Shrub/seedling/sapling, tree saplings <11" DBH
2A	<40% tree canopy closure
2B	40-70% tree canopy closure
2c	>70% tree canopy closure
3	Small sawtimber; 11-24 DBH
3A	<40% overstory canopy closure
3B	40-70% overstory canopy closure
3c	>70% overstory canopy closure
4	Medium to large sawtimber, >24" DBH
4A	<40% overstory canopy closure
4B	40-70% overstory canopy closure
4c	>70% overstory canopy closure
4C-older	Same as 4C, except older and more decadent
5	Two storied stand; scattered overstory above a well-stocked understory

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\* For forested lands only.



# APPENDIX V - PRIORITIES FOR REVISING GRAZING ALLOTMENT MANAGEMENT PLANS

## 1992-1995

Campbell Mountain  
Champs Flat  
Cone Ward South  
Harvey Valley  
Hot Spnngs  
Lower Pine Creek  
North Eagle  
South Eagle Lake  
Tehama  
Upper Pine Creek

## 1996-2000

Benner  
Bndge Creek  
Butte Meadows  
Clover Valley  
Grays Valley  
Silver Lake  
Susan River  
Feather River  
Hat Creek  
Manzanita Lake

## 2001-2005

Martin-Digger  
Morgan Springs  
North Battle Creek  
Poison Lake  
Rice Creek  
Robbers Creek  
Antelope  
Deer Creek  
Homer Lake  
Lyonsville

## 2006-2010

Soldier Meadows  
South Hot Springs  
Bear Valley  
Cayton  
Dixie Valley  
Gooch Valley  
West Humbug  
Willow Springs  
Blue Lake  
Bull Hill

## 2011-2015

Butt Creek  
Coon Hollow  
Murphy Hill  
North Creek and North Butte  
North Hot Springs  
Soldier Mountain  
Bainbridge  
Bald Mountain  
Butte Creek  
Coyote Springs

## 2016-2020

Horse Valley  
Murken Lake  
Proctor Creek  
Signal Butte  
Six Mile  
Chips Creek  
Collins  
Coyote  
Diamond Mountain  
Fredonyer  
Mountain Meadows

Note This schedule is tentative, and may change to be more responsive to resource conditions or permit administration needs

# Notes