

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
MEDFORD DISTRICT OFFICE

FINDING OF NO SIGNIFICANT IMPACT
LOST CREEK SOUTH ANALYSIS AREA

The proposed action is to harvest between 21 and 25 million board feet of timber on Matrix lands as designated in the Record of Decision for the Northwest Forest Plan Environmental Impact Statement (SEIS/ROD), pg. 7. The proposed projects of timber harvest, water catchment renovation, and road work are located within the Lost Creek Watershed of the Butte Falls Resource Area, Medford District BLM. All projects are located on public lands administered by the BLM.

The project is located in;
T.33S., R.2E., sections 11, 13, 15, 21, 23, 24, 25, 26, 27, & 35
T.33S., R.3E., sections 18, 19, 29, 30, & 31
Willamette Meridian, Jackson County, Oregon.

Surveys have been completed for cultural resources, threatened and endangered animals, special status plants, and all required survey and managed surveys have been completed. If any cultural, listed or federal candidate specie is found, the site would be avoided or mitigation applied.

The proposed action is described in more detail in the Lost Creek South Analysis Area Environmental Assessment (EA). The EA discussing the proposed projects is in conformance with the Medford District Resource Management Plan, Record of Decision (ROD), dated April 14, 1995. The EA is also consistent with the ROD on the Final Supplemental Environmental Impact Statement on management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl (SEIS).

Based on the analysis of potential environmental impacts contained in the EA, I have determined that the impacts of authorizing the proposal will not have significant effects on the human environment, and therefore an Environmental Impact Statement (EIS) is not required. An EIS is not required because the action is consistent with the standards and guidelines set forth in the SEIS ROD and RMP ROD, therefore no significant impact to the human or natural environment will occur.

This notice of **Finding of No Significant Impact (FONSI)** is provided through the BLM Medford District's central registration and advertised in the Medford Mail Tribune, Grants Pass Courier, Rogue River Press, and Upper Rogue Independent. Copies of the EA are available at the Medford District Office.

Approved By: 

Lance E. Nimmo
Butte Falls Area Manager

6-11-98
Date

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
MEDFORD DISTRICT

DECISION RECORD
for the proposed

LOST CREEK SOUTH ENVIRONMENTAL ASSESSMENT

DECISION

It is my decision to authorize the proposed action in the **Lost Creek South Environmental Assessment**. The proposed action is described as **Alternative 4** which includes the following:

1. Timber Harvest on Matrix Lands

The overall scope of this action alternative covers approximately 1341 acres of Bureau of Land Management managed lands designated Matrix, located in T33S, R2E, sections 11, 13, 15, 21, 23, 24, 25, 26, 27, & 35, T33S, R3E, sections 18, 19, 29, 30, & 31; Willamette Meridian, Jackson County, Oregon. The silvicultural treatment methods identified under this alternative are: 425 acres of commercial thin, 639 acres of selective cut, 29 acres of structural retention, 24 acres of shelterwood retention, 33 acres of connectivity modified even-aged, 191 acres of modified even-aged.

Harvest methods would include tractor (822 acres), skyline cable (314 acres) and helicopter (205 acres).

No new system road construction would occur. All logging and hauling would use existing roads. Access spurs will be constructed and following use will be fully decommissioned.

2. Road Related Projects

67.59 miles of road would be renovated and improved to upgrade existing roads to reduce erosion and sediment deposits into streams.

Road closures would occur on 37 roads or road segments totaling 18.69 miles under this EA. The following is a breakdown of different types of closures:

Seasonal/Temporary (guardrail or gate)	1.58 miles
Decommission	13.86 miles
Full Decommission	3.25 miles

3. Pond or Water Catchment Renovation

The pond or water catchment renovation consists of work necessary to bring the existing ponds to the standard to which it was originally built, for example fire and dust abatement. This work includes, but not limited to, cleaning, repairing, or replacement of inflow and overflow devices, removing sediment to restore original water-retaining capacity, end hauling excavated material, cutting vegetation around the catchment, and repairing any damage to the retaining structure and/or the approach road.

Water Developments: A Road, Beaver Dam #1, Beaver Dam #2, Blue Goose #1, Blue Goose #2, Laurelhurst, and Smith Creek.

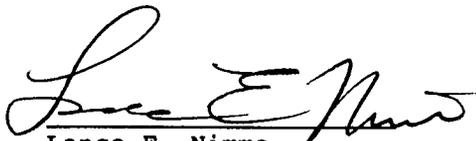
RATIONALE for DECISION

My decision to authorize the proposed action is in compliance with the Record of Decision on the FSEIS (FSEIS ROD) and the Medford District Resource Management Plan (RMP), dated April 14, 1995. The timber sale area is located within Matrix lands. The proposed action complies with all applicable standards and guidelines. This action takes into consideration cumulative impacts of past harvesting and silviculture practices both on private and Federal lands.

Matrix lands include Southern General Forest Management Areas, Northern General Forest Management Areas and Connectivity/Diversity Blocks. To improve stand vigor and growth, a combination of the following silviculture methods will be used; commercial thinning of 425 acres, selection cutting of 639 acres, structural retention regeneration harvest of 29 acres, retaining a minimum of 16-25 trees per acre greater than 20 inches dbh, shelterwood retention regeneration harvest of 24 acres, retaining a minimum of 12-25 trees per acre greater than 20 inches dbh, connectivity/modified even-aged regeneration harvest of 33 acres, retaining a minimum of 12-18 trees per acre greater than 20 inches dbh, and modified even-aged regeneration harvest of 191 acres, retaining a minimum of 6-8 trees per acre greater than 20 inches dbh.

The objective of road improvement is to upgrade existing roads to reduce erosion and fine sediment deposition into streams. Road decommissioning would reduce road densities, erosion, and sediment deposition into streams.

The pond or water catchment renovation consists of work necessary to bring the existing ponds to the standard to which it was originally built, for example fire and dust abatement. This work includes, but not limited to, cleaning, repairing, or replacement of inflow and overflow devices, removing sediment to restore original water-retaining capacity, end hauling excavated material, cutting vegetation around the catchment, and repairing any damage to the retaining structure and/or the approach road.



Lance E. Nimmo
Butte Falls Area Manager

8-5-98
Date

May 19, 1998

Environmental Assessment for Lost Creek South Analysis Area

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
MEDFORD DISTRICT
BUTTE FALLS RESOURCE AREA

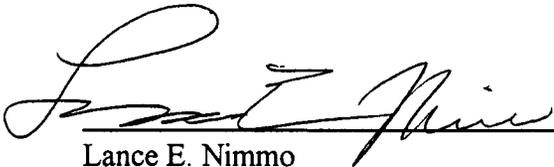
ENVIRONMENTAL ASSESSMENT FOR
LOST CREEK SOUTH ANALYSIS AREA

Project Name/Number: OR-110-98-16

Project Location: T. 33S., R.2E., Sections 11, 13, 15, 21, 23, 24, 25, 26, 27, & 35
T. 33S., R.3E., Sections 18, 19, 29, 30, & 31
Willamette Meridian, Jackson County, Oregon

Project Lead: John Osmanski, Forester
EA Preparation: Jean Williams, Environmental Coordinator

This environmental assessment (EA) for the Lost Creek South Analysis Area was prepared utilizing a systematic interdisciplinary approach integrating the natural and social sciences and the environmental design arts with planning and decision making.



Lance E. Nimmo
Butte Falls Area Manager

6-11-98
Date

The environmental assessment and Finding of No Significant Impact (FONSI) were made available for public review on June 9, 1998

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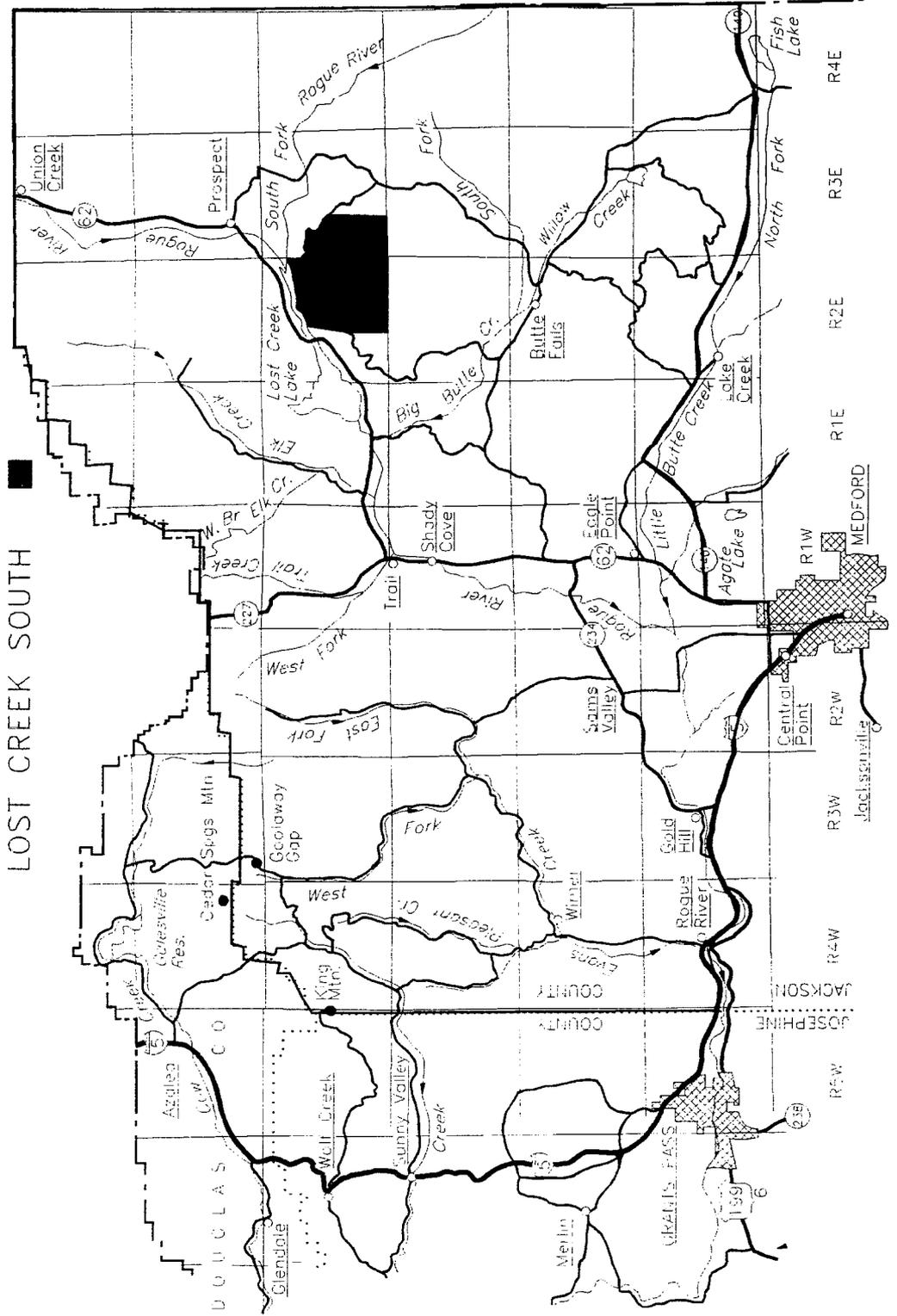
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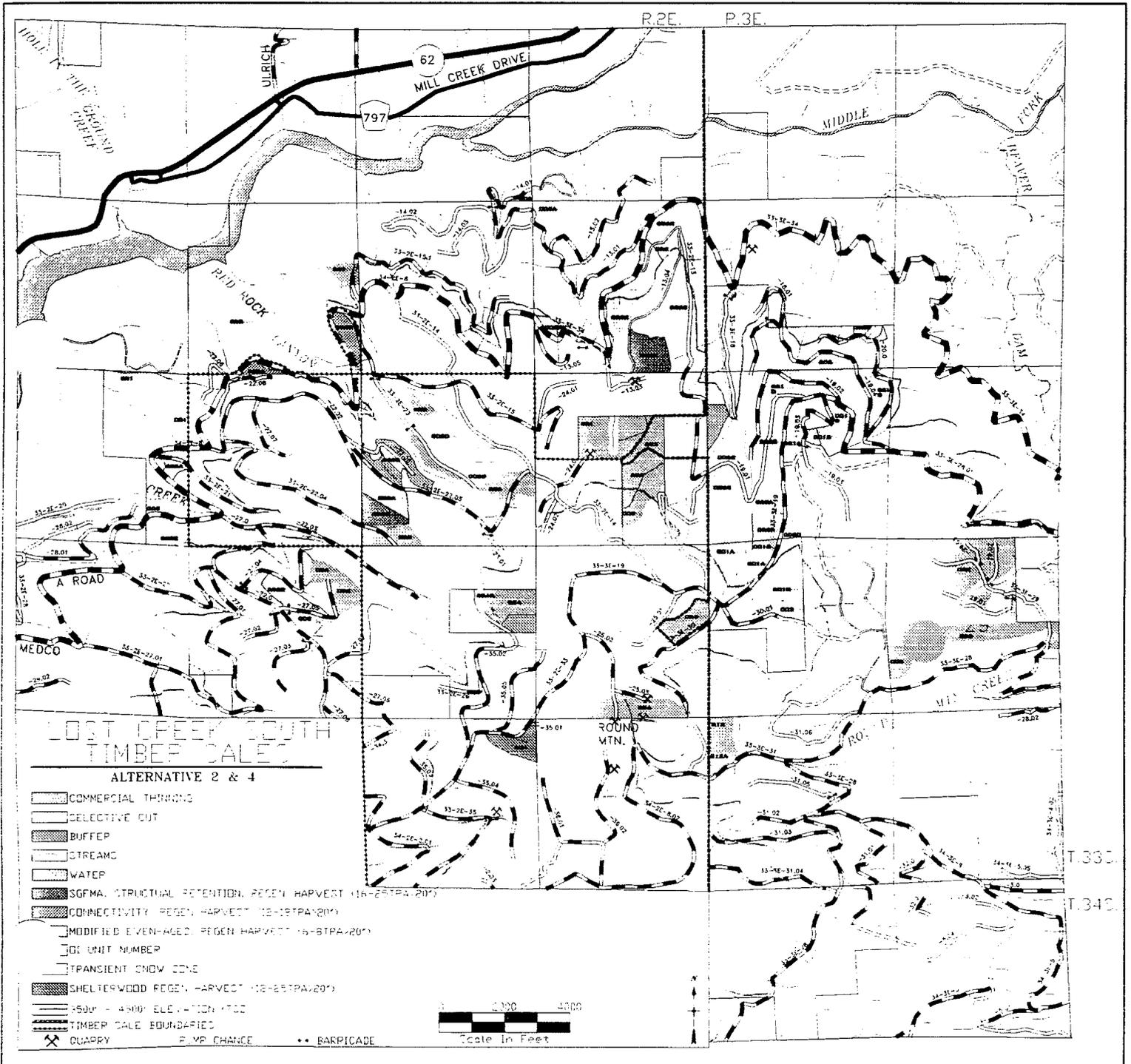
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BUREAU OF LAND MANAGEMENT Butte Falls Resource Area General Location Map

LOST CREEK SOUTH



MAP 2



INTRODUCTION

The Butte Falls Resource Area (BFRA) proposes to implement forest management activities in the Lost Creek Watershed for timber harvest, road maintenance work, and pump chance renovation. The total analysis area is 16,179 acres in size. The BLM manages 7,877 acres (49%) of the analysis area; the Corp of Engineers manages 92 acres (1%) of the analysis area; the remaining 8,205 acres (50%) are private lands. All timber harvesting would occur within Matrix lands. The road work would occur within Matrix and Riparian Reserves as designated in the Record of Decision for the Northwest Forest Plan Environmental Impact Statement (SEIS/ROD) p 7. All projects are located on public lands administered by the BLM. (See map 1 for project location.)

I. PURPOSE OF AND NEED FOR ACTION

The purpose of the Environmental Assessment (EA) is to analyze the effects of harvesting timber from this analysis area, renovation of seven pump chances, and road related projects associated with the timber sales and analysis area. The proposed actions would contribute to the District's decadal Probable Sale Quantity (PSQ).

Action is needed to implement the goals, objectives and desired future condition on Matrix lands as described in the Record of Decision for the Northwest Forest Plan, the Medford District's Resource Management Plan and the Watershed Analysis for Lost Creek, (see Table 1).

Timber Harvest

Many timber stands in the watersheds are in need of treatment to improve vigor and growth. Conditions are variable; some stands have more trees than the site can sustain, while other stands have numerous trees that are declining and at higher risk of mortality due to moisture limitations, insects, or disease.

Fire suppression has allowed a shift in species composition from drought and fire tolerant species towards stands dominated by white fir. White fir is more susceptible to fire damage and also has a lower tolerance to moisture shortages as compared to ponderosa and sugar pine, Douglas-fir, hardwood species, and incense cedar. With this species shift, tree species diversity will decline and an important natural defense against prolonged drought, potential climatic change, and fire would be lost. These changing conditions may also lead to an increase in stand susceptibility to insect infestations, diseases, and wildfire.

To improve stand vigor and growth, combinations of the following silvicultural methods are proposed:

1. Commercial thinning; thinning would increase spacing between trees, creating conditions similar to the effects of a light underburn that would have killed smaller diameter trees. Removal of smaller and less vigorous trees would reduce competition and provide additional moisture and nutrients for the remaining dominant and co-dominant trees. Depending on the alternative selected, canopy closure would be approximately 40% to 60% following treatment.
2. Selective cut; density levels would be reduced towards the carrying capacity of the site. Individual trees across all diameter sizes would be removed to reduce inter-tree competition for light, moisture, and nutrients. Canopy openings would be created allowing for the establishment of small trees as well as providing stand diversity. Depending on the alternative selected, canopy closure would be approximately 40% to 60% following treatment. Multiple canopy layers and structural diversity would be maintained or enhanced. Large trees would be present and provide for long term biological legacies.
3. Regeneration harvests would occur in deteriorating stands and stands with Douglas-fir trees infected with mistletoe. Combinations of four different silvicultural regeneration systems are proposed.
 - a). Structural retention; a minimum of 16-25 trees per acre greater than 20 inches in diameter at breast height (dbh) would remain following entry. All merchantable trees less than 20 inches dbh would be removed. Canopy closure would be approximately 25-40%. Planting of conifer seedlings would occur following harvest.
 - b). Shelterwood retention; a minimum of 12-25 trees per acre greater than 20 inches dbh would remain following entry. All merchantable trees less than 20 inches dbh would be removed. Canopy closure would be approximately 20-40%.
 - c). Connectivity modified even-aged; a minimum of 12-18 trees per acre greater than 20 inches dbh would remain following entry. All merchantable trees less than 20 inches dbh would be removed. Canopy closure would be approximately 20-30%. Planting of conifer seedlings would occur following harvest.
 - d). Modified even-aged; a minimum of 6-8 trees per acre greater than 20 inches dbh would remain following entry. All merchantable trees less than 20 inches dbh would be removed. Canopy closure would be approximately 10-15%. Planting of conifer seedlings would occur following harvest.

Alternatives 3 & 4 would not remove all trees less than 20 inches dbh. Douglas-fir, incense cedar, ponderosa pine, sugar pine, and hardwoods that are vigorous and disease free would be left. These trees would provide for additional structural diversity and greater canopy closure.

4. Mortality salvage; individual trees in deteriorating stands would be removed. Trees removed would be of low vigor, insect infested or Douglas-fir trees with mistletoe ratings of 5 or 6. Canopy closure following entry would be 60% or greater.

No Riparian Reserves have been identified which would benefit by actively managing the forest stands. By maintaining a one site-tree Riparian Reserve buffer and no proposed density management within the Riparian Reserve, the following Aquatic Conservation Strategy (ASC) objectives would be met; 1, 2, 4, 5, 6, 7, 8, & 9 (ROD, pg.B11).

Road Related Projects

Renovation or Renovate - This consists of work to be performed on the road prior to its use. The work includes, but is not limited to, blading the road surface, ditching, cleaning or enlarging catch basins, flushing corrugated metal pipes (CMP), removing brush near the inlet or outlet of pipes, cleaning inlet and outlet end of pipes, and removing brush, limbs, and trees along the roadway to improve sight distance. All drainage structures including CMP's, water dips, and ditch relief outlets shall be inspected and required work performed so that water flow is not impeded. These actions would occur on approximately 64 miles of road.

Road Improvement - The objective of road improvement is to upgrade existing roads to reduce erosion and sediment deposits into streams. Actions would include increasing cross drain structures, increasing culvert size, rocking inadequately surfaced roads, and stabilizing cutbanks and fillslopes by establishing vegetative cover. These actions would occur on approximately 6 miles of road.

Road Decommissioning - These actions would be based on resource protection needs identified in watershed analysis and the RMP directives. The road segment would be closed to vehicles on a long-term basis, but may be used again in the future. Prior to closure, the road would be prepared to avoid future maintenance needs; the road would be left in an "erosion-resistant" condition by establishing cross drains and/or waterbars, and removing and/or reducing fills in stream channels and potentially unstable fill areas. Exposed soils would be treated to reduce sedimentation. The road would be closed with a device similar to an earthen barrier (tank trap) or equivalent. These actions would occur on approximately 14 miles of road.

Road Full Decommissioning - Roads determined through an interdisciplinary process to have no future need will be subsoiled (or tilled), seeded, mulched, and planted to reestablish vegetation. Cross drains, fills in stream channels, and potentially unstable fill areas would be removed to restore natural hydrologic flow. The road would be closed with a device similar to an earthen (tank trap) barrier or equivalent. The road would not require future maintenance. These actions would occur on approximately 3 miles of road.

Pond or Water Catchment Renovation

The pond or water catchment renovation consists of work necessary to bring the existing pond to

the standard to which it was originally built, for example fire and dust abatement. This work includes, but not limited to, cleaning, repairing, or replacement of inflow and overflow devices, removing sediment to restore original water-retaining capacity, end hauling excavated material, cutting vegetation around the catchment, and repairing any damage to the retaining structure and/or the approach road.

Table 1. Project objectives

•	Improve forest ecosystem health, diversity, and resiliency. (Lost Creek Watershed Analysis pgs 75-77)
•	Minimize the increase of non-recovered openings with in the TSZ. (Medford District Resource Management Plan, pp 153)
•	Provide a sustainable supply of timber. (Medford District Resource Management Plan, pp 72)
•	Reduce the risk of road generated sediment. (Lost Creek Watershed Analysis pp 85)
•	Minimize adverse impacts to soils. Maintain or improve long-term soil productivity. (Medford District Resource Management Plan, pp 44)
•	Maintain suitable habitat adjacent to selected owl cores. Maintain connectivity across the landscape in designated critical habitat. (Lost Creek Watershed Analysis pp 77)

A. Conformance With Existing Land Use Plans

The proposed timber harvest would be in conformance with the BLM land use plans for the subject areas. The proposed harvest is consistent with management objectives and silvicultural systems for the public lands identified in the Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl (SEIS), approved April 13, 1994, and the Record of Decision and Resource Management Plan for the Medford District (RMP), approved June 1995.

All of the acreage (1341 acres) proposed for harvest has been identified as Matrix lands. As defined in the SEIS (page C-39) and the RMP (pages 38-40), the Matrix consists of those federal lands outside of the six categories of designated reserve areas in which most timber harvest would

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Environmental Assessment for Lost Creek South Analysis Area

be conducted according to standards and guidelines. The Environmental Impact Statements (EISs) prepared in conjunction with the SEIS and the RMP included analysis of this land use allocation. Unless site-specific inventory or analysis determines timber harvesting is not suitable based on the existence of resource values (e.g., cultural resources, habitat for threatened and endangered species), this document would not readdress the suitability of Matrix lands for timber harvesting, but rather the appropriate intensity and method of harvesting and conformance of the proposed harvesting within the standards and guidelines.

B. Relationship to Statutes, Regulations, and Other Plans

The proposed action and alternatives are in conformance with the direction given for the management of public lands in the Medford District by the Oregon and California Lands Act of 1937 (O&C Act) and the Federal Land Policy and Management Act of 1976 (FLPMA). The BLM is directed to manage the lands covered under the O&C Act for permanent forest production under the principles of sustained yield. BLM is also required to comply with other environmental and conservation laws, such as the Endangered Species Act of 1973 and the Water Pollution Prevention and Control Act, while implementing the mandates given by FLPMA and the O&C Act. The proposed action and alternatives are in conformance with these laws.

This environmental assessment (EA) is being prepared to determine if the proposed action and any of the alternatives would have a significant effect on the human environment, thus requiring the preparation of an Environmental Impact Statement (EIS) as prescribed in the National Environmental Policy Act of 1969. It is also being used to inform interested parties of the anticipated impacts and provide them with an opportunity to comment on the various alternatives. Further, the EA is being used to arrive at a final project design to meet a variety of resource issues.

Finally, the EA is also being used to provide the decision maker, the Butte Falls Resource Area Manager, the most current information relating to these projects upon which to base a decision.

C. Decisions to be Made Based on the Analysis

The Butte Falls Resource Area Manager must decide if the impacts of implementing the proposed action or the alternatives would result in significant effects to the human environment, thus requiring that an EIS be prepared before proceeding with the proposed action as prescribed in the National Environmental Policy Act of 1969.

The area manager must decide if the BLM should harvest trees, close roads, and renovate pump chances in the Lost Creek watershed, and which areas would be treated.

If the decision maker should decide to select one of the action alternatives, the analysis in this EA will be used to help determine where harvesting and other landscape treatments could occur.

D. Summary of Scoping Activities

Scoping letters were sent to adjacent landowners and to the interested publics. The letter requested comments concerning issues that would be addressed in the Environmental Assessment. Responses are on file in the Butte Falls Resource Area, Medford BLM.

E. Issues

1. Issues Considered But Not Analyzed in Detail

Many issues were discussed during the interdisciplinary team (IDT) meetings for these proposals. (See Chapter V for a list of preparers). After discussing the issues, the IDT determined that while these issues and concerns were real, many were outside the scope of the EA and others were not major issues for this proposal that would affect the human environment. For a more in depth discussion of these issues, see Appendices.

- a) Cultural resources--locations would be protected. (Appendix A)
- b) Special Status Plant-- surveys have been completed on all sites and none were discovered (Appendix B)
- c) T&E Wildlife/Sensitive species--spotted owl activity centers would not be entered. Appropriate seasonal restrictions would be implemented. Great gray owl surveys would be completed by June 30, 1998. (Appendix C)
- d) Visual Resources Management (VRM)--meets RMP VRM standards (Appendix A)
- e) Mining--no active mining claims in the area
- f) Road Closures (Appendix K)

2. Issues Identified Through The Scoping Process To Be Analyzed In This EA

The issues identified through the initial scoping effort and through the interdisciplinary team process are listed in Table 2. Indicators or measurements are suggested that may be used to compare how the alternatives address the issues. Chapter II contains a comparison summary of the alternatives and their response to the issues.

Table 2. ISSUES TO BE ANALYZED IN DETAIL

Issue 1: Dense forest stands, declining stand and tree vigor

Ź The stands proposed for thinning and selective harvest have more trees than the site can sustain. Removal of competing and low vigor trees would reduce competition and provide additional site resources (nutrients, water, sunlight) for the remaining trees. The stands proposed for regeneration harvest are deteriorating or have Douglas-fir trees that are infested with mistletoe; these conditions are threatening the integrity of the stand. Stands with high densities and mistletoe infestation result in declining tree vigor and growth, tree mortality and an increased susceptibility to insect attack, root disease infection, and fire.

Indicators for measuring this issue are:

- Acres receiving silvicultural treatment
- Change in the number/density of trees per acre
- Change in growth of timber stands after treatment

Issue 2: Transient Snow Zone (TSZ)

Ź The TSZ is an elevation band (3500-4500 feet) where snow pack can accumulate in non-recovered openings (less than 60-70% canopy cover in forested areas) and is at a high risk for a rain-on-snow occurrence. Typically, rain-on-snow events produce flood conditions which can severely alter stream channel morphology and degrade aquatic habitat. Activities such as timber harvest and road and landing construction increase the amount of openings in the tree canopy where snow can accumulate. This can increase the magnitude of runoff in a rain-on snow event.

Indicators for measuring this issue are:

- Percent of total watershed acres within the TSZ that have less than 60-70% canopy cover
- Size of openings in the TSZ

Issue 3: Owls/Connectivity

Ź The NW Forest Plan provides connectivity across Matrix lands via the interspersions of older seral habitat in Riparian Reserves and 100 acre spotted owl cores, supplemented by a few Connectivity Blocks (designated in the Medford District ROD). The intent was to maintain more nesting and foraging habitat, rather than just dispersal habitat in designated critical habitat.

Indicators for measuring this issue are:

- Owl sites continue to nest.
- Number of acres of older seral stands maintained.

II. ALTERNATIVES INCLUDING THE PROPOSED ACTION

A. Introduction

The Butte Falls Resource Area has developed three action alternatives to achieve the project objectives in the Lost Creek Watershed Analysis (refer to pages 74 to 83). After receiving comments from the public through the scoping process, the alternatives were developed by a team of resource specialists. The Lost Creek Watershed Analysis provided information that was used in the analysis.

This chapter summarizes the consequences of the alternatives. The selected alternatives are described by the issue and how the alternative would affect the key issue.

In this chapter you will find:

- A description of alternatives considered but eliminated;
- A description of the no-action alternative;
- A description of the features common to all action alternatives;
- A description of each action alternative;
- A comparison of how each alternative affects the major issues listed in Chapter I.

B. Alternatives Considered But Eliminated

The following alternatives were eliminated due to site specific analysis.

1. ALTERNATIVE A-1: See appendix E, for a list of specific units originally considered but eliminated from consideration due to silvicultural or stand characteristic, access concerns, unstable soils, or wildlife concerns.

See Table 3 for a summarized description of the selected alternatives.

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Environmental Assessment for Lost Creek South Analysis Area

TABLE 3: DESCRIPTION OF THE ALTERNATIVES				
Action	Alternative 1 No Action	Alternative 2 ROD	Alternative 3 Canopy Retention	Alternative 4 Modified
Timber Harvest :				
Total area (Matrix) treated:	0 acres	1341 acres	1230 acres	1341 acres
Estimated volume	0 MBF	28-33 MMBF	14-16 MMBF	21-25 MMBF
Logging methods:				
* tractor	0 acres	812 acres	727 acres	812 acres
* cable	0 acres	324 acres	298 acres	324 acres
* helicopter	0 acres	205 acres	205 acres	205 acres
Silvicultural Method :				
* commercial thin	0 acres	425 acres	425 acres	425 acres
* selective cut	0 acres	639 acres	639 acres	639 acres
* structural retention	0 acres	29 acres	0 acres	29 acres
* shelterwood retention	0 acres	24 acres	24 acres	24 acres
*connectivity/modified even-aged	0 acres	33 acres	0 acres	33 acres
* modified even-aged	0 acres	191 acres	51 acres	191 acres
* mortality salvage	0 acres	0 acres	91 acres	0 acres
Slash Treatment				
*Excavator Pile	0 acres	396 acres	197 acres	346 acres
*Handpile	0 acres	160 acres	124 acres	160 acres
*Lop and Scatter	0 acres	814 acres	909 acres	814 acres
*Underburning	0 acres	21 acres	0 acres	21 acres
Planting	0 acres	423 acres	199 acres	423 acres
Road Projects:				
* Miles of roads improved	0 miles	6 miles	6 miles	6 miles
* Miles of roads renovated	0 miles	64 miles	64 miles	61 miles
Road closure:				
* Seasonal/Temporary	0 miles	2 miles	2 miles	2 miles
*Decommission	0 miles	14 miles	14 miles	14 miles
*Full Decommission	0 miles	3 miles	3 miles	3 miles
Pump Chance				
*Blue Goose Spring 1&2	No maintenance	Renovate	Same as alternative 2	Same as alternative 2
*A Road	No maintenance	Renovate		
*Beaver Dam 1 & 2	No maintenance	Renovate		
*Smith Creek	No maintenance	Renovate		
*Laurelhurst	No maintenance	Renovate		
*A Road	No maintenance	Renovate		

C. Alternatives Examined in Detail

1. ALTERNATIVE 1--NO ACTION

Analysis of this alternative provides a baseline against which the effects of the action alternative can be compared. For this EA, the No Action Alternative is defined as not harvesting timber or completing the other projects as defined.

2. ALTERNATIVE 2 - ROD STANDARD AND GUIDELINES & RMP MANAGEMENT DIRECTION FOR MATRIX LANDS

The intent of this alternative is to achieve the goals, objectives, and desired future condition for the timber stands as specified in the Northwest Forest Plan and the Medford District Resource Management Plan. This alternative includes the projects described below:

a) Timber Harvest (See Map 2 for project location)

The overall scope of this action alternative covers approximately 1341 acres of BLM managed lands designated Matrix. Matrix lands include Southern General Forest Management Areas, Northern General Forest Management Areas and Connectivity/Diversity Blocks. This action consists of six silvicultural methods:

1. Commercial thinning of 425 acres where individual small trees are removed from dense stands in order to redistribute growth to vigorous dominant and co-dominant trees. At least 40% canopy closure would be retained.
2. Selection cutting of 639 acres that removes individual trees from all diameter classes. Stand densities would be reduced, freeing up site resources (water and nutrients) for the remaining trees. At least 40% canopy closure would be retained.
3. Structural retention regeneration harvest of 29 acres, retaining a minimum of 16-25 trees per acre greater than 20 inches dbh. All merchantable trees less than 20 inches dbh would be removed. The residual canopy closure would be approximately 25-40%. Planting of conifer seedlings would occur following harvest.
4. Shelterwood retention regeneration harvest of 24 acres, retaining a minimum of 12-25 trees per acre greater than 20 inches dbh. All trees less than 20 inches dbh would be removed. The residual canopy closure would be approximately 20-40%. Planting of conifer seedlings would occur following harvest.

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Environmental Assessment for Lost Creek South Analysis Area

5. Connectivity/modified even-aged regeneration harvest of 33 acres, retaining a minimum of 12-18 trees per acre greater than 20 inches dbh. All merchantable trees less than 20 inches dbh would be removed. The residual canopy closure would be approximately 20-30%. Planting of conifer seedlings would occur following harvest.

6. Modified even-aged regeneration harvest of 191 acres, retaining a minimum of 6-8 trees per acre greater than 20 inches dbh. All merchantable trees less than 20 inches dbh would be removed. Canopy closure would be approximately 10-15%. Planting of conifer seedlings would occur following harvest.

b) Roads

The following roads would be renovated and improved by adding crushed rock material:

#33-2E-14.00 C, D	1 mile		
#33-3E-19.01 A	1 mile	#34-2E-8.00 B2, C1	4 miles

Road closure would occur on 37 roads or road segments totaling approximately 19 miles under this EA. The following is a breakdown of different types of closures:

Seasonal/Temporary (guardrail or gate)	2 miles
Decommission	14 miles
Full Decommission	3 miles

Road Closure Within the Riparian Reserve

In meeting the goals of the Aquatic Conservation Strategy (ACS), approximately 5800 feet of roads within the Riparian Reserves are proposed for full decommissioning. Full decommissioning activities would include ripping of the road surface, blocking road, and revegetating the area with grasses, brush, hardwood, and conifer species that are appropriate to the site. Closure of roads within the Riparian Reserve would meet the following ACS objectives: 1, 2, 4, 5, 6, 7, 8, and 9.

c) Pump Chances

Water Developments with Water Rights or Exempt Reservoir Status

Water Development	Legal Description	Source, Tributary of:	Gallons Per Minutes Permitted	Management Action	Uses
A Road	T.33S., R2E Sec. 31 SW 1/4 SE 1/4	Unnamed stream, Rogue River	14.95	Deepen on both ends and end-haul material to landing above pond.	Livestock, wildlife, Prescribed fire, road operations
Beaver Dam #1	T.33S., R3E., Sec 33 NW 1/4 NW 1/4	Unnamed stream, Beaver Dam Creek	9.55	Deepen and remove vegetation from in and around pond.	Livestock, wildlife, Prescribed fire, road operations
Beaver Dam #2	T.33S., R3E., Sec 33 NE 1/4 NE 1/4	Unnamed stream, Beaver Dam Creek	0.55	Deepen and remove vegetation from in and around pond.	Livestock, wildlife
Blue Goose #1 Spring Reservoir	T.33S., R.3E., Sec.29 NW 1/4 SE 1/4	Spring, Round Mountain Creek	5.55	Deepen and remove vegetation from in and around pond. Improve approach road.	Livestock, wildlife, Prescribed Fire
Blue Goose #2 Spring Reservoir	T.33S., R.3E., Sec.29 NW 1/4 SE 1/4	Spring, Round Mountain Creek	---	Deepen and remove vegetation from in and around pond.	

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Laurelhurst	T.33S., R2E Sec. 31 NE 1/4 SW 1/4	Unnamed stream, Rogue River	11.35	Deepen and end-haul material up road miles to a landing.
Smith Creek	T. 33S.,R.3E., Sec. 18 NW 1/4 SW 1/4	Smith Creek, South Fork Rogue River	8.8	Deepen and end-haul material.

3. ALTERNATIVE 3 - CANOPY RETENTION

The intent of this alternative is to minimize the creation of forest openings in the transient snow zone (TSZ). This alternative would maintain 60% or greater canopy closure in all stands treated within the TSZ. This alternative includes the projects described below:

a) Timber Harvest (See Map 3 for project location)

The overall scope of this action alternative covers approximately 1230 acres of BLM managed lands designated Matrix. Matrix lands include Southern General Forest Management Areas, Northern General Forest Management Areas and Connectivity/Diversity Blocks. This action alternative consists of five silvicultural methods:

1. Commercial thinning of 425 acres where individual small trees are removed from dense stands in order to redistribute growth to vigorous dominant and co-dominant trees. At least 60% canopy closure would be retained.
2. Selection cutting of 639 acres that removes individual trees from all diameter classes. Stand densities would be reduced, freeing up site resources (water and nutrients) for the remaining trees. Large, medium, and small trees would remain and provide for structural and biological diversity. At least 60% canopy closure would be retained.
3. Shelterwood retention regeneration harvest of 24 acres would occur outside of the transient snow zone. A minimum of 12-25 trees per acre greater than 20 inches dbh would be retained. All vigorous and disease free Douglas-fir, incense cedar, ponderosa pine, sugar pine and hardwoods less than 20 inches dbh would be left. Canopy closure following entry would be approximately 20-30%. Planting of conifer seedlings would occur following harvest.
4. Modified even-aged regeneration harvest of 51 acres would occur in five stands outside of the transient snow zone. A minimum of 6-8 trees per acre greater than 20 inches dbh would be retained. All vigorous and disease free Douglas-fir, incense cedar, ponderosa pine, sugar pine, and hardwoods less than 20 inches dbh would be left. Canopy closure following entry would be approximately 10-15%. Planting of conifer seedlings would occur following harvest.
5. Mortality salvage of 91 acres in deteriorating stands within the TSZ. Trees removed would be those facing imminent mortality, those with insect infestation or trees with a mistletoe risk rating of 5 or 6. The canopy closure following entry would be 60% or greater.

b) Roads

Same as alternative 2.

c) Pump Chances

Same as alternative 2

4. ALTERNATIVE 4 - MODIFIED ROD STANDARDS AND GUIDELINES

The intent of this alternative is to achieve the goals, objectives, and desired future condition for the watershed as specified in the Northwest Forest Plan, the Medford District Resource Management Plan and Lost Creek Watershed Analysis. This alternative provides for greater landscape connectivity, higher canopy closure and more structural diversity in treated stands as compared to the ROD and RMP management guidelines. This alternative includes the projects described below:

a) Timber Harvest (See Map 2 for project location)

The overall scope of this action alternative covers approximately 1341 acres of BLM managed lands designated Matrix. Matrix lands include Southern General Forest Management Areas, Northern General Forest Management Areas and Connectivity/Diversity Blocks. This action consists of six silvicultural methods:

1. Commercial thinning of 425 acres where individual small trees are removed from dense stands in order to redistribute growth to vigorous dominant and co-dominant trees. At least 60% canopy closure would be retained.
2. Selection cutting of 639 acres that removes individual trees from all diameter classes. Stand densities would be reduced, freeing up site resources (water and nutrients) for the remaining trees. Large, medium, and small trees would remain and provide for structural and biological diversity. At least 60% canopy closure would be retained.
3. Structural retention regeneration harvest of 29 acres, retaining a minimum of 16-25 trees per acre greater than 20 inches dbh. All vigorous and disease free Douglas-fir, incense cedar, ponderosa pine, sugar pine and hardwoods less than 20 inches dbh would be left. Canopy closure following entry would be approximately 25-40%. Planting of conifer seedlings would occur following harvest.
4. Shelterwood retention regeneration harvest of 24 acres, retaining a minimum of 12-25 trees per acre greater than 20 inches dbh. All vigorous and disease free Douglas-fir, incense cedar, ponderosa pine, sugar pine and hardwoods less than 20 inches dbh would be left. Canopy closure following entry would be approximately 20-30%. Planting of

conifer seedlings would occur following harvest.

5. Connectivity/modified even-aged regeneration harvest of 33 acres, retaining a minimum of 12-18 trees per acre greater than 20 inches dbh. All vigorous and disease free Douglas-fir, incense cedar, ponderosa pine, sugar pine and hardwoods less than 20 inches dbh would be left. Canopy closure following entry would be approximately 20-30%. Planting of conifer seedlings would occur following harvest.

6. Modified even-aged regeneration harvest of 191 acres, retaining a minimum of 6-8 trees per acre greater than 20 inches dbh. All vigorous and disease free Douglas-fir, incense cedar, ponderosa pine, sugar pine, and hardwoods less than 20 inches dbh would be left. Canopy closure following entry would be approximately 10-15%. Planting of conifer seedlings would occur following harvest.

b) Roads

Same as alternative 2.

c) Pump chances

Same as alternative 2

D. MANAGEMENT ACTIONS COMMON TO ALL ACTION ALTERNATIVES (Project Design Features--PDF)

1. Minimize the total number of skid roads by designating skid roads with an average of 150' spacing. Avoid creating new skid roads and utilize existing roads where feasible in order to minimize ground disturbance, especially in thinning and selective cut units where no tillage is proposed.
2. All tractor yarding, soil tillage, and excavator piling operations would be restricted from October 15 to May 15 or when soil moisture exceeds 25%. Rip identified access spur roads to a depth of 18" utilizing a subsoiler or winged-toothed ripper.
3. Lop and scatter, pile activity slash, or underburn activity slash. Burn piled slash during the fall and winter to reduce impacts on air quality. All burning would follow the guidelines of the Oregon Smoke Management Plan.
4. Restrict tractor yarding operations to slopes generally less than 35%. In areas where it is necessary to exceed 35%, utilize ridge tops where possible.
5. Waterbar all skid roads during the same operating season.

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6. All road renovation, closure, and/or improvement work would be restricted from October 15 to May 15 or when soil moisture exceeds 25%.
7. Block or barricade identified roads after use and before beginning of rainy season (generally October 15).
8. Implement seasonal restriction of March 1 to September 30 for activities within ¼ mile of known spotted owl sites, and within ½ mile of helicopter operations, unless birds are determined not to be nesting. Maintain a 100 acre core area for each owl site known prior to January 1, 1994.
9. Implement seasonal restriction April 1 to August 30 for activities within ¼ mile of known goshawk sites, and within ½ mile of helicopter operations, unless birds are determined not to be nesting. Maintain a 30 acre core area for each nesting pair.
10. Maintain all snags, except those which need to be felled for safety reasons. Those snags that must be felled would be left on site.
11. Implement a seasonal restriction within ¼ mile from April 1 thru July 15 for all Coopers Hawk and Sharp Shinned Hawk nests. Maintain a 15 acre and 10 acres core area for each Coopers Hawk nesting pair, and Sharp Shinned Hawk nesting pair respectively.
12. No timber harvesting would occur within Riparian Reserves.
13. No new roads or skid roads would be constructed within the Riparian Reserve lands.
14. Roads within the Riparian Reserves identified for full decommissioning would be revegetated with a composition of conifers, hardwoods, brush, and grass species which would be typically found in that riparian ecosystem.
15. Skid roads would be located to minimize disturbance to coarse woody debris. Where skid roads encounter large, coarse woody debris (CWD) a section of the CWD is to be bucked out for equipment access. The remainder of the CWD is to be left in place and not disturbed.
16. Directional fall all trees away from cabin site located in T33S., R2E., section 24.

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Table 4. THE ALTERNATIVES AND THE ISSUES - SUMMARY OF THE CONSEQUENCES				
Issues	Alternative 1 No Action	Alternative 2 ROD Standards and Guidelines for Matrix Lands and Riparian Reserves	Alternative 3 Canopy Retention	Alternative 4 Modified
<p>1) Dense forest stands and declining stand and tree vigor</p> <p>* Acres receiving treatment</p> <ul style="list-style-type: none"> * commercial thin * selective cut * structural retention * shelterwood retention * connectivity modified even-aged * modified even-aged * mortality salvage <p>* Change in density of trees per acre in: -</p> <p>commercial thinning and selective cuts. - regeneration harvests - trees per acre >20" dbh</p> <p>* Change in growth rate in:</p> <ul style="list-style-type: none"> - commercial thinning and selective cuts. - regeneration harvests 	<p>0 acres</p> <p>Relative Density 65 to >100% 17-40</p> <p>Minimum growth per tree, growth/acre offset by mortality Minimum growth per tree, growth/acre offset by mortality</p>	<p>425 acres</p> <p>639 acres</p> <p>29 acres</p> <p>24 acres</p> <p>33 acres</p> <p>191 acres</p> <p>0 acres</p> <p>Relative density 35-40% 6-25</p> <p>Stand vigor & growth maximized</p> <p>Growth potential redirected to planted conifers</p>	<p>425 acres</p> <p>639 acres</p> <p>0 acres</p> <p>24 acres</p> <p>0 acres</p> <p>51 acres</p> <p>91 acres</p> <p>Relative density 50-60% 6-25</p> <p>Stand vigor & growth increased Growth potential redirected to planted conifers</p>	<p>425 acres</p> <p>639 acres</p> <p>29 acres</p> <p>24 acres</p> <p>33 acres</p> <p>191 acres</p> <p>0 acres</p> <p>Relative density 50-60% 6-25</p> <p>Stand vigor & growth increased Growth potential redirected to planted conifers.</p>
Transient Snow Zone	No change	Increase the risk for higher magnitude and frequency of peak flows in local stream channels.	No change	Increase the risk from Alt. 3 for higher magnitude and frequency of peak flows, but decrease the risk from Alt. 2.
Connectivity	No change	Connectivity would be heaviest impacted.	Recovery to nesting and foraging habitat would be more rapid.	Regen units would remove nesting and foraging habitat for up to 60+ years.

The numbers shown are estimates based upon field data, growth models, and existing resource knowledge and studies.

III. AFFECTED ENVIRONMENT

A. Introduction

This chapter describes the present condition of the environment within the proposed project area that would be affected by the alternatives. The information in this chapter would serve as a general baseline for determining the effects of the alternatives. No attempt has been made to describe every detail of every resource within the proposed project area. The information is organized around the major issues identified by the interdisciplinary team. Only enough detail has been given to determine if any of the alternatives would cause significant impacts to the human environment as defined in 40 CFR 1508.27. Surveys have been completed for cultural resources, threatened and endangered animals, special status plants, and all required survey and managed surveys have been completed (See appendix A, B and C).

The following critical elements are not known to be present within the proposed project areas, or would not be affected by any of the alternatives, and would not be discussed further: Areas of Critical Environmental Concern, Cultural Resources, Prime or Unique Farmlands, Flood plains, Native American Religious Concerns, Water Quality, Wetlands, Wild and Scenic Rivers, and Wilderness.

B. General Description of the Proposed Project Area

A description of the land areas and resources in the Butte Falls Resource Area is presented in Chapter 3 of the Final Medford District Resource Management Plan/Environmental Impact Statement (RMP 1995).

For a detailed description of the Lost Creek watershed, see the Lost Creek Watershed Analysis, completed in January 1998, which is available at the Butte Falls Resource Area, Medford District BLM Office.

1. Dense Forest Stands and Declining Stand and Tree Vigor

Excess stocking of conifer trees has resulted in declining growth rates and decreased stand vigor. Individual tree vigor is declining, as moisture, nutrients, and sunlight availability are becoming limited due to increased inter-tree competition. Moisture and nutrients are important factors that dictate the health and resiliency of a forest ecosystem. Dense stands that exceed the "carrying capacity" of the site's resources are not ecologically sustainable.

In some stands, dwarf mistletoe infection in Douglas-fir is causing a decline in tree vigor. Dwarf mistletoe reduces growth and increases mortality. Heavily infested trees are more susceptible to insects and root diseases and are more likely to die prematurely.

Fire suppression has allowed a shift in species composition towards shade tolerant white fir and has created conditions which are more susceptible to insect infestations, diseases, and wildfire.

2. Transient Snow Zone (TSZ)

The TSZ is an elevation band (3500-4500 feet) where snow pack can accumulate and is at a high risk for a rain-on-snow occurrence. Typically, rain-on-snow events produce flood conditions which can severely alter stream channel morphology and degrade aquatic habitat.

Activities such as timber harvest and road and landing construction create openings in the tree canopy where snow can accumulate. This increases the magnitude of runoff in a potential rain-on snow event. Typically, a canopy cover of 60% or more is considered adequate to reduce this potential effect.

Through cumulative effects analysis of the watershed compartments in this project area, it has been determined there are a substantial amount of non-recovered openings (less than 60% canopy cover) in the TSZ as a result of past timber harvest activities (particularly on privately owned timberlands). This creates a high level of risk for a rain-on-snow occurrence and the subsequent degradation it can cause.

3. Connectivity

The NW Forest Plan provides connectivity across Matrix lands via the interspersion of older seral habitat in Riparian Reserves and 100 acre spotted owl cores, supplemented by a few Connectivity Blocks (designated in the Medford District ROD). US Fish & Wildlife Service (USFWS) designated a portion of the analysis area as a spotted owl Critical Habitat Unit in 1992 to provide additional linkage between large late successional reserves (LSRs). The intent was to maintain more nesting and foraging habitat, rather than just dispersal habitat. Of five known spotted owl sites, three have been productive and currently have well over 100 acres of adjacent suitable nesting habitat. The size of the core for the remaining two owl sites has been limited by previous adjacent harvest.

For additional detail on the owl connectivity situation, as well as a description of other sensitive species, see the Wildlife Report in Appendix C. One northern goshawk nest was discovered in 1997 in a potential unit. This species is currently undergoing review by USFWS for potential listing under the Endangered Species Act.

IV. ENVIRONMENTAL CONSEQUENCES

A. Introduction

This chapter is organized by issue to describe the anticipated environmental impacts of the alternatives on the affected environment. It provides the basis for comparing the alternatives presented in Chapter II. The detail and depth of impact analysis is generally limited to that which is necessary to determine if significant environmental impacts are anticipated.

B. Effects From Implementing Alternative 1 (No Action)

1. Dense Forest Stands and Declining Stand and Tree Vigor

a) Direct and Indirect Effects

Stand densities would remain high, resulting in the continued demand and competition for moisture, sunlight and nutrients. Current tree densities are resulting in increased competition and declining tree growth. The number of trees per acre is above the biologically sustainable level, resulting in a greater susceptibility to insects, disease, and severe fire behavior.

In the absence of disturbance events such as fire, density management, or regeneration harvests, the shift in species composition would continue toward more shade tolerant white fir. With high densities and closed canopies, white fir would eventually crowd out the more drought and fire resistant species, such as ponderosa pine, sugar pine, Douglas-fir, and incense cedar. With this species shift, tree species diversity would decline and an important natural defense against prolonged drought, potential climatic change, and fire would be lost.

Deteriorating stands would not be entered and would remain at high risk to insect attacks, continued mistletoe infestation, and tree mortality. These stands would continue to shift towards stands dominated by drought and fire intolerant white fir.

b) Short-term Uses vs. Long-term Productivity

In the short-term (5-10 years) the No Action alternative would result in the continuation of the existing forest conditions. Eventually, due to dense and deteriorating stand conditions, the probability of insect infestations and disease infections would be greater which would likely result in a decrease in long-term production.

c) Irreversible/Irretrievable Commitments of Resources

None identified.

d) Cumulative Effects

An increase in insects, diseases, and higher fire risk due to high stand densities would be expected. With high stand densities and high canopy closure, more shade tolerant species would prevail. These species are usually more susceptible to insects and diseases and less able to withstand fire events. Ultimately, the No Action alternative would result in a species shift from mixed conifer stands to stands dominated by white fir.

2. Transient Snow Zone

a) Direct and Indirect Effects

None anticipated

b) Short-term Uses vs. Long-term Productivity

None anticipated

c) Irreversible/Irretrievable Commitments of Resources

None anticipated

d) Cumulative Effects

There would be no change in the existing condition.

3. Connectivity

a) Direct and Indirect Effects

Current, older seral connectivity would be maintained across the federal lands. Spotted Owls and Goshawks would be expected to continue to nest.

b) Short-term Uses vs. Long-term Productivity

In the short-term (5-10 years), late-successional conditions would improve as canopies close up within formerly partial-cut units. After several decades of interruption of the natural fire cycle, fuels will have accumulated so as to increase the potential for a stand-replacement fire, but this vicinity is at lower risk than most of the resource area due to higher elevation. Long-term, spotted owls and goshawks would remain productive in the area.

c) Irreversible/Irretrievable Commitments of Resources

None identified

d) Cumulative Effects

Actively managed, intermingled private timberlands will be maintained in earlier seral stages so no more than half the landscape would be on an older seral trajectory.

C. Effects of Implementing Action Alternative 2 - ROD AND RMP

1. Dense Forest Stands and Declining Stand and Tree Vigor

a) Direct and Indirect Effects

In stands identified for thinning, smaller and less vigorous trees would be harvested, accelerating the development of larger diameter and taller trees so that the characteristics of a mature stand are developed faster. Maintaining larger

trees with fuller crowns would provide sufficient tree canopies to reduce vegetative competition from brush and hardwoods. The larger trees and resulting canopies would also provide cover for a variety of wildlife species. Stand vigor and growth would be maximized with density levels at full site occupancy.

In selectively cut stands, the number of trees would be reduced towards the carrying capacity of the site. Full site occupancy would be maintained with stand vigor and growth maximized. Canopy closure in commercial thinning and selective cut stands would be decreased from 90-100% to approximately 40% plus.

In stands identified for regeneration harvests, variable levels of vigorous green trees greater than 20 inches dbh would be left. Canopy closure would be reduced to 10-40%, depending on the level of green tree retention. Herbaceous, shrub, and tree species composition would be shifted toward shade intolerant species, reversing the current trend towards shade tolerant species.

b) Short-term Uses vs. Long-term Productivity

In the short-term, the vigor of thinned and selectively cut stands would be increased. The long-term productivity would be expected to increase due to increased stand vigor and species diversity being maintained or increased.

In the regeneration harvests, overstory trees would provide for structural and biological legacies. The species mix and density level of planted trees would trend towards the plant communities and stocking levels that historically would have been present. Late successional characteristics would be expected to redevelop in approximately 80 years.

c) Irreversible/Irretrievable Commitments of Resources

None anticipated.

d) Cumulative Effects

Treatment under this alternative would result in stands which are more vigorous, healthy, and resilient to environmental changes. Stand growth and vigor would be maximized. Stand susceptibility to insect attack, disease infection, and fire would be expected to be reduced. Species composition would shift towards drought and fire tolerant species.

2. Transient Snow Zone

a) Direct and Indirect Effects

This alternative would increase the amount of TSZ openings (less than 60% canopy closure) by 898 acres. This would increase the risk for higher magnitude and frequency of peak flows in local stream channels. These high flows can alter stream morphology and degrade aquatic habitat. Quantification of the effects of this proposal are not currently known.

b) Short-term Uses vs. Long-term Productivity

The long-term productivity (greater than 10 years) of stream channels (aquatic habitat) within the project area can be adversely effected if a rain-on-snow event were to occur.

c) Irreversible/Irretrievable Commitments of Resources

None anticipated

d) Cumulative Effects

See direct and indirect effects.

3. Connectivity

a) Direct and Indirect Effects

This alternative would be the heaviest impact to the spotted owls.

b) Short-term Uses vs. Long-term Productivity

In the short-term (5-10 years), nesting and foraging habitat would be reduced. In the long-term the habitat would be the same as the short-term.

c) Irreversible/Irretrievable Commitments of Resources

Same as alternative 3.

d) Cumulative Effects

Same as Alternative 1

D. Effects From Implementing Action Alternative 3 - CANOPY RETENTION

1. Dense Forest Stands and Declining Stand and Tree Vigor

a) Direct and Indirect Effects

Commercial thinning and selective cutting would reduce stand densities towards the upper limit of the carrying capacity of the stands treated. Stand vigor and individual tree growth would be enhanced although not maximized. The majority of the trees removed would be those most at risk of competition mortality, insect attack or disease

infection. White fir would be discriminated against when possible, shifting the species mix back towards more drought and fire tolerant species. Canopy closure would be decreased from 90-100% to 60-70%, with multiple canopy layers present in the selectively cut stands.

Mortality salvage would allow for the removal of the poorest vigor trees within deteriorating stands. Imminent mortality, insect attacked, or heavily mistletoe infested trees would be selected for removal. Canopy closure would be decreased from 80-85% to 60-70%. Overall stand conditions would not change. Stand vigor and growth would remain low. Susceptibility to insect attack or disease would be moderately reduced.

In the stand identified for shelterwood retention harvest, canopy closure would be reduced from 60% to 20-25%. Herbaceous, shrub and tree species composition would be shifted toward shade intolerant species, reversing the current trend towards shade tolerant species. Structural diversity would be reduced and canopy layers would be limited to the residual overstory trees, trees less than 8 inches dbh, and scattered vigorous trees 8-20" dbh.

In stands identified for modified even-aged harvests canopy closure would be reduced to from 60-80% to 10-20%. Herbaceous, shrub and tree species composition would be shifted toward shade intolerant species, reversing the current trend towards shade tolerant species. Structural diversity would be low, canopy layers would be minimal and limited to scattered overstory trees, trees less than 8 inches dbh and occasional vigorous trees 8-20" dbh.

Deteriorating stands that are not entered will remain at high risk to insect attacks, disease infection, and tree mortality. These stands will continue to shift towards stands dominated by drought and fire intolerant white fir.

b) Short-term Uses vs. Long-term Productivity

In the short-term, the vigor of thinned and selectively cut stands would be moderately increased. An increase in growth would be expected once the root systems of the residual trees expand and are able to utilize the additional moisture and nutrients. The long-term productivity would be expected to increase due to increased stand vigor and species diversity being maintained.

Mortality salvage would remove the lowest vigor trees most likely to die due to insects, disease (root pathogens), mistletoe, or poor crown condition. Long term site productivity for conifer growth would remain low. Species composition and diversity would shift from mixed conifers and hardwoods towards stands dominated by white fir.

In the shelterwood retention and modified even-aged regeneration stands, overstory trees would provide for structural and biological legacies. Planted conifer species and density levels would trend towards the plant communities and stocking levels that historically would have been present. These stands would begin to redevelop late successional characteristics after approximately 80 years.

c) Irreversible/Irretrievable Commitments of Resources

None are anticipated.

d) Cumulative Effects

Treatment under this alternative would result in stands which are more vigorous, healthy and resilient to environmental changes than present conditions. Stand susceptibility to insect attack, disease infection, and fire would be expected to be reduced.

2. Transient Snow Zone

a) Direct and Indirect Effects

All proposed harvest units in the TSZ would maintain a 60% or greater canopy closure. Therefore, no anticipated direct or indirect effects on TSZ openings would occur.

b) Short-term Uses vs. Long-term Productivity

None anticipated

c) Irreversible/Irretrievable Commitments of Resources

None anticipated

d) Cumulative Effects

Maintaining 60% or greater canopy in all harvest units within the TSZ would allow more time for other cut over areas to continue to revegetate (increase canopy closure) and reduce the overall risk of a high amount of TSZ openings

3. Connectivity

a) Direct and Indirect Effects

60% canopy closure would provide dispersal habitat and return to foraging habitat much sooner.

b) Short-term Uses vs. Long-term Productivity

In the short-term the habitat would be disrupted; within 20-30 years the habitat would return to quality.

E. Effects of Implementing Action Alternative 4 - Modified

1. Dense Forest Stands and Declining Stand Vigor

a) Direct and Indirect Effects

Commercial thinning and selective cutting would reduce stand densities towards the upper limit of the carrying capacity of the stands treated. Stand vigor and individual tree growth would be enhanced although not maximized. The majority of the trees removed would be those most at risk of competition mortality, insect attack or disease infection. White fir would be discriminated against when possible; shifting the species mix back towards more drought and fire tolerant species. Canopy closure would be decreased from 90-100% to 60-70%, with multiple canopy layers present in the selectively cut stands..

In stands identified for regeneration harvests, variable levels of vigorous green trees greater than 20 inches dbh would be left. Canopy closure would be reduced to 10-40% depending on the level of green tree retention. Structural diversity would be reduced and canopy layers would be limited to the residual overstory trees, trees less than 8 inches dbh, and scattered vigorous trees 8-20" dbh. Herbaceous, shrub and tree species composition would be shifted toward shade intolerant species, reversing the current trend towards shade tolerant species.

b) Short-term Uses vs. Long-term Productivity

In the short-term, the vigor of thinned and selectively cut stands would be moderately increased. An increase in growth would be expected once the root systems of the residual trees expand and are able to utilize the additional moisture and nutrients. The long-term productivity would be expected to increase due to increased stand vigor and species diversity being maintained.

In the regeneration harvests, overstory trees would provide for structural and biological legacies. The planted species mix and density levels would trend towards the plant communities and stocking levels that historically would have been present. Late successional characteristics would be expected to develop in approximately 80 years.

c) Irreversible/Irretrievable Commitments of Resources

None anticipated.

d) Cumulative Effects

Treatment under this alternative would result in stands which are more vigorous, healthy, and resilient to environmental changes than present conditions. Stand susceptibility to insect attack, disease infection, and fire would be expected to be reduced.

2. Transient Snow Zone

a) Direct and Indirect Effects

This proposed alternative would increase the amount the TSZ openings (less than 60% canopy closure) by 200 acres. This would increase the risk for higher magnitude and frequency of peak flows in local stream channels from those in alternative 3, but would decrease the risk from alternative 2. These high flows can alter stream morphology and degrade aquatic habitat. Quantification of the effects of this proposal are not currently known.

b) Short-term Uses vs. Long-term Productivity

The long-term productivity (greater than 10 years) of stream channels (aquatic habitat) within the project area can be adversely effected in a rain-on-snow event were to occur.

c) Irreversible/Irretrievable Commitments of Resources

None anticipated

d) Cumulative Effects

See direct and indirect effects

3. Connectivity

a) Direct and Indirect Effects

Regen units would remove nesting and foraging habitat for spotted owls for up to 60 years.

b) Short-term Uses vs. Long-term Productivity

In the short term (2-10 years), maintaining 60% canopy closure in selective cut or thinning units will reduce owl suitability on those acres until the stands close back in and the prey species recover from the habitat disruption. Adequate dispersal habitat would be maintained across the landscape. Probability of continued owl reproduction would be reduced. Regen units would remain unsuitable in the long-term until the stands grew back into a forest (60+ years)

Goshawks would be impacted in the 2-5 year term, but in the longer term, the thinning would return to suitable habitat, and this species would be expected to remain productive.

c) Irreversible/Irretrievable Commitments of Resources

Same as for all three of the action alternatives- none identified. The assumption is that even a clearcut is not an irreversible impact since the trees are capable of growing back in 100 years.

d) Cumulative Effects

Same as for all the action alternatives. This would be the only proposed habitat alteration in the sale sections for the next 5 years. Intermingled private timberlands are projected to be entered within the next two years but currently

there is very little suitable owl habitat. Goshawks would be expected to continue to forage on the private lands since this species hunts edges.

V. List of Preparers

NAME	RESPONSIBILITIES
John Osmanski, Forester	Silvicultural Prescription Writer
Jim Harper, Wildlife Biologist	T&E Animals
Jon Raby, Fisheries Biologist	Fisheries/ Aquatic Ecosystems
John Dinwiddie, Fuels Specialist	Fuels/Air Quality
Ron Miyamoto, Engineer	Engineering, Road design
Ken Van Etten, Soil Scientist/Hydrologist	Soils, Water, Wetlands, Floodplains
Doug Kendig, Riparian Reserve Coordinator	Riparian/T&E Plants
Tim Haller, Recreation Planner	Recreation/Cultural and Historical/VRM
Randy Fiske, Engineer	Engineering, Road design
Aaron Thayer, Forester	Layout
John Bergin, Forester	Timber Sale Contract Administration
Bob Smith, Engineer	Engineering, Road design
Jean Williams, Environmental Coordinator	EA Writer

Appendix A

Affected Environment

Recreation

The main recreation activity which occurs within the sale area is hunting. Other less frequent activities include sightseeing, and small forest products collecting. Some camping and off-highway vehicle use occurs but it is limited and usually associated with hunting.

Several dispersed recreation sites occur within the sale area. These dispersed sites are primarily hunting camp locations that are rarely used outside of hunting seasons. Some dispersed recreation sites closer to Lost Creek Reservoir are used for camping during the summer because of their close proximity to the recreation opportunities that exist at Lost Creek reservoir and the Rogue river. The impacts are expected to be minimal to these sites because most of the harvest units are not visible from the more frequently used dispersed recreation sites.

A recreational activity increasing in the area is tour route driving. One tour route is visible from the sale area. Highway 62 is part of the Rogue-Umpqua Scenic Byway. This is a national, state and forest service designated scenic byway, and many projects are underway to enhance the recreational opportunities along this route.

Visual Resources

According to the Medford District Resource Management Plan, lands within the viewshed of Lost Creek reservoir are to be classified as VRM class II (Medford Proposed RMP Chapter 2-41). It states that “management activities may be seen but should not attract the attention of the casual observer”. Much of the sale area falls within this VRM classification. The stated classifications are as follows.

VRM I: Preserve the existing character of landscapes

VRM II: Retain the existing character of the landscapes.

VRM III: Partially retain the existing character of landscapes.

VRM IV: Allow major modifications of existing character of landscapes.

It has been concluded that harvest activities within this sale will meet the specifications under VRM II because they will not attract the attention of the casual observer from Lost Creek Reservoir or Highway 62. Harvest activities on private land will be more likely to attract attention from the viewer. The existing character of the landscape is of broken forest canopies because of previous timber sale activities on private and public lands, thus the proposed activities will cause insignificant changes to the current landscape.

RECEIVED

Project: BF97-35 Lost Creek Inventory
Date: 12/23/97
Resource Area: Butte Falls
County: Jackson
USGS Quad: McLead, Cascade Group,

DEC 24 1997
STATE PARKS AND
RECREATION DEPARTMENT

Prospect South, Whetstone Butte, Big Butte Springs 7.5'
For further information contact: Kate Winthrop Phone #: 541-770-2321
Medford BLM District

The criteria of effect listed in 36CFR800.9 (1986) have been applied to the above referenced project on the cultural resources identified in the attached report.

X In accordance with 36CFR800.5(b), we have determined that the proposed undertaking will have NO EFFECT. We will retain documentation and proceed with the undertaking unless you object within 15 days of receipt of this notice.

X In accordance with 36CFR800.5(d), we have determined that the proposed undertaking will have NO ADVERSE EFFECT. We will retain documentation and proceed with compliance unless you object within 30 days of receipt of this notice (see below):

- The project is covered under PMOA: _____ with a day time frame;
- Attached is a research design for DATA RECOVERY option;
- Attached are formal determinations of eligibility.

 In accordance with 36CFR800.5(e), we have determined that the proposed undertaking will have an ADVERSE EFFECT. We will retain documentation and proceed with compliance unless you object within 30 days.

X CONCUR
 DO NOT CONCUR
REMARKS:

DATE: JAN 12 1998
[Signature]
Signature

NOTED
CHISEN

Appendix B

TO: LOST CR. T.S. E.A. LEAD
FROM: DOUGLAS KENDIG RIPARIAN AND SENSITIVE PLANT SPECIALIST
DATE: APRIL 23, 1998
SUBJECT: LOST CREEK E.A.
SPECIAL STATUS PLANTS

Current Condition

The Medford District is one of the most botanically diverse areas in the United States. Usually, locations of special status plants are discovered during clearances for ground disturbing activities, mainly timber sales and more recently plantation maintenance work. Thirty-three Special Status Plant Species are known in the Butte Falls R.A. on 213 sites.

Lost Creek watershed has few rare plant species. Special Status Plant surveys were conducted on approximately 2615 acres within the watershed over the past 10 years. 1370 acres of the original project area proposed in Lost Creek Timber Sale were surveyed in 1997. Surveys were conducted by intuitively controlled transect methodology through the project area by field botanists with emphasis on special habitats such as riparian areas, meadows, rock outcrops, as well as mature forest habitat. A comprehensive list of all vascular plants was created by unit.

No Special Status Plant populations were discovered during the surveys.

SURVEY AND MANAGE SPECIES (table C-3, Northwest Forest Plan ROD, 1994)

No surveys are required at this time for Survey and Manage Plant species. All Survey and Manage vascular plants are included on the BLM Medford District Special Status Plants list and were actively searched for during vascular plant field surveys. However, during subsequent project site visits, various survey and manage nonvascular plants were discovered.

The following is a table of Survey and Manage Non-Vascular plants discovered during field visits and their status.

GROUP - LICHEN	SURVEY STRATEGY	LOCATION	GENERAL DESCRIPTION OF POPULATION	MANAGEMENT RECOMMENDATION
Lobaria oregana	4	Common throughout area	Common on boles of trees.	NONE
Lobaria pulminaria	4	Common throughout area	Common on boles of trees.	NONE
Pseudocyphellaria anthrapsis	4	Common throughout area	Common on boles and branches of understory trees.	NONE

GROUP - FUNGI	SURVEY STRATEGY	LOCATION	GENERAL DESCRIPTION OF POPULATION	MANAGEMENT RECOMMENDATION
<i>Pithya vulgaris</i>	1 and 3	T33-3E-30	Scattered individuals on white-fir litter.	Establish 3 ac buffer to protect habitat. FSEIS Appen. J2-203

See Management Recommendations for Survey and Manage Fungi, 1997, ver. 2.0, page 27-1.

PROTECTION BUFFER SPECIES

GROUP - PROTECTION BUFFER SPECIES	SURVEY STRATEGY	LOCATION	GENERAL DESCRIPTION OF POPULATION	MANAGEMENT RECOMMENDATION
<i>Sarcasoma mexicana</i>	Protection Buffer	T33-3E-30	Approximately 50 individuals scattered across Matrix land.	Establish 3 Ac Reserve Buffer around core population area.
<i>Sarcasoma mexicana</i>	Protection Buffer	T33 2E-24	2 individuals within Riparian Reserve	Protected within Riparian Reserve.
<i>Buxbaumia sp.*</i>	Protection Buffer	T33-3E-30 T33 2E-24	Small populations scattered on coarse woody debris.	Will determine species and appropriate management.

See Medford district Record of Decision and Resource Management Plan, 1995, page 54-55.

*The bryophyte *Buxbaumia* has been discovered during project evaluation. However, the sporocarps have not matured and the specific species can not be determined until later in the season.

GROUP - Mollusks	SURVEY STRATEGY	LOCATION	GENERAL DESCRIPTION OF POPULATION	MANAGEMENT RECOMMENDATION
<i>Fluminicola sp.*</i>		T33-2E-13	Discovered at mouth of spring.	Protected within established Riparian Reserve.

*The mollusk *Fluminicola* has been discovered during project evaluation. However, the specific species has not been determined.

**MANAGEMENT ACTIONS COMMON TO ALL ACTION ALTERNATIVES
(Project Design Features--PDF)**

1. Skid roads would be constructed to minimize disturbance to coarse woody debris. Coarse woody debris would be cut rather than pushed for equipment access.

APPENDIX

POTENTIAL SENSITIVE PLANT SPECIES IN LOST CREEK WATERSHEDS

List of Special Status vascular plant species that potentially occur within the project area of Lost Creek T.S.

SPECIES	CURRENT STATUS
<i>Allotropa virgata</i>	SEIS
<i>Cimicifuga elata</i>	BSO
<i>Cypripedium fasciculatum</i>	BSO, SEIS
<i>Cypripedium montanum</i>	SEIS
<i>Illiamna latibracteata</i>	BAO
<i>Limnanthes floccosa</i> <i>ssp. bellingeriana</i>	BSO
<i>Lithophragma heterophyllum</i>	BTO
<i>Mimulus douglasii</i>	BWO
<i>Nemacladus capillaris</i>	BAO
<i>Perideridia howellii</i>	BWO
<i>Plagiobothrys glyptocarpus</i>	BAO
<i>Romanzoffia thompsonii</i>	BSO
<i>Scribnaria bolanderii</i>	BWO

Status Codes:

- FE Federal Endangered (USFW) - in danger of extinction throughout a significant portion of its range
- FT Federal Threatened (USFW) - likely to become endangered species within the foreseeable future
- SoC Species of Concern (formerly Federal Candidate 1, 2, 3) (USFW) - under consideration for listing, but additional information is needed to support a proposal to list under the Endangered Species Act
- SE State Endangered - in danger of extinction in the state of Oregon

- ST State Threatened - listed as likely to become endangered by the state of Oregon
- SC State Candidate - listing is pending, or appropriate, if immediate conservation action not taken
- BSO Bureau Sensitive Oregon - ONHP List 1; Oregon Candidate. Generally these species are restricted in range within Oregon and have natural or human caused threats to their survival.
- BAO Bureau Assessment Oregon - ONHP List 2; Species where population trends are monitored and may require a minimum amount of protection or mitigation BLM activities.
- BTO Bureau Tracking Oregon - ONHP List 3 and 4
- SM Survey & Manage - Northwest Forest Plan ROD, 1994, Table C-3 directs management of known sites and/or survey for new sites
- 1 Oregon Natural Heritage Rank, critically imperiled throughout its range
 - 2 Oregon Natural Heritage Rank, imperiled throughout its range
 - 3 Oregon Natural Heritage Rank, not rare, threatened throughout its range
 - 4 Oregon Natural Heritage Rank, not rare, apparently secure throughout its range

Allotropa virgata (Candy Stick) is a saprophyte generally found in late-successional stands. The plant is terrestrial and very colorfully striped red and white. Habitat conditions vary from relatively open rock outcrops with shallow soils and moderate organic debris to more closed canopy sites with deeper soils.

Cimicifuga elata (Tall Bugbane) is a rare vascular plant which is associated with old-growth forests. No sites have been found in the Butte Falls R.A, however populations were discovered to the north and south of the resource area.

Cypripedium montanum (Clustered Lady's-slipper) is a small orchid dependant upon conditions associated with late-successional and mature forest communities. They are terrestrial species adapted to partial to full canopy closure with a moderate accumulation of organic debris and litter necessary. They are deep rooted in soil. There appears to be a microrhizza association also.

Cypripedium montanum (Brown Lady's-slipper) is a showy flowered orchid dependant upon conditions associated with mid to later successional forest communities. They are terrestrial species adapted to partial to full canopy closure with a moderate accumulation of organic debris. They are deep rooted in soil. There appears to be a microrhizza association also.

Scribnaria bolanderii is a rather inconspicuous native grass, generally associated with seasonally wet areas or seeps on rock cliffs. Known locations occur on sandstone and basalt rock outcrops and areas with shallow soils. Bolander's grass has been found at scattered locations from southern California to Washington.

Appendix C

WILDLIFE REPORT - Lost Creek South EA

Jim Harper, Wildlife Biologist

3 April 98 DRAFT

(File: timbersa\lostcree\lost2ea.wpd sstabtex)

The proposal is to offer the analysis area as three timber sales. The first (the east third) would sell late in FY 98 as Round Fork. The other two sales (one helicopter, one conventional yarding) would sell in FY 99. The attached appendix table contains the various sensitive species that occur in the resource area, and lists probability of occurrence in the analysis area and the level of survey work done.

There are three action alternatives besides the no action. The numbering may get changed in later drafts of the EA.

Alt 2 - Regen harvest would occur only outside the transient snow zone. Selective cut or thinning stands would maintain minimum 60% canopy closure.

Alt 3 - Southern GFMA guidelines would be applied (retain 16-25 trees per acre) in the transient snow zone, and Northern GFMA guidelines would be applied (retain 6-8 trees per acre) elsewhere in stands recommended for regen harvest. Thinning units would maintain 40% canopy closure.

Alt 4 - Thinning stands would maintain 60% canopy closure. Regen harvest would be the same as in alt 3. This alternative would be the lowest impact of the action alternatives from the wildlife perspective.

Listed Species

Consultation - In compliance with the Endangered Species Act, a BLM and USFS programmatic basin wide biological assessment was submitted to US Fish & Wildlife Service (USFWS) on August 1 1996 to cover FY 97 & 98 actions. The Service responded with a Biological Opinion on 18 October 1996. Actions carrying over into FY 99 and 2000 will be resubmitted in July 98 and an updated biological opinion is expected by September prior to any FY99 sale date. All the acres proposed under this EA were consulted upon in the FY 97-98 package. Since the Service already granted Incidental Take for the spotted owl May Affect situation of harvesting suitable habitat and impacting several known sites, we expect that the Incidental Take will be extended in the updated consultation process for the portion of this EA that may extend into FY 99.

Bald Eagle

The one known nest site at Lost Creek Reservoir is 3 miles from the nearest proposed unit. When not near the nest, adult eagles spend most of their time foraging and loafing near the lake, and not upland in sale units. This lake has the potential to support a second nesting pair, but a helicopter search in 1997 found no additional eagles. No shoreline perching habitat will be altered, although helicopter yarding in section 15 is close to potential perching areas. These units will have a seasonal restriction for eagles and spotted owls from March 1 through June 15. The project will be a “no effect” for bald eagles. If a new nest were discovered, the E-4 contract stipulation would be used to halt operations until a mitigation plan could be devised.

Peregrine Falcon

The nearest known nest is 8 miles from the closest proposed unit, and the nearest potential nesting cliffs are 2½ miles distant. Adult falcons could be expected to occasionally forage for prey in the sale area, but the project would be a “no effect”. Nesting peregrines are making a comeback in Oregon, but any cliff habitat in the vicinity is of low quality (too short in height, no ledges), so the probability of nesting here is very low. Foraging birds would not be adversely affected by alteration of forest stands or helicopter operations when at this distance from the nesting cliffs.

Northern Spotted Owl

Survey effort and land status: Every proposed sale section was intensively surveyed from 1990 thru 1996 as part of an OSU owl density study. We feel that all the resident territories have been identified. There could be additional “floaters” (single owls that move during the nesting season through an area) that are nonresident and hard to pin down. All territorial adult owls have been color banded to facilitate long-term monitoring. Their reproductive history is depicted in the attached appendix table. The Taggarts Creek site was one of the original Spotted Owl Management Areas (SOMA), that under the old Management Framework Plan (MFP) had a no-cut reserve of 1,260 acres designated in 1984. The MFP has been superceded by the NW Forest Plan that mandates a minimum 100 acre core for owl sites in Matrix lands known as of January 1 1994. There are no newly discovered sites here since the 94 cutoff.

There would be a seasonal restriction from March 1 thru September 30 within 1/4 mile of nesting pairs. The restriction would be waived if the owls were determined to be non-nesting. The restriction would extend to ½ mile radius for helicopter operations to minimize disturbance, unless there was a significant terrain break to block the noise.

The Taggarts Creek section (15) is a designated Connectivity Block, as is the section (29) that contains the Blue Goose owl site. Connectivity Blocks, as defined in the Medford RMP (pg 48) are to “maintain at least 25 to 30 percent of each block in late-successional forest. Riparian reserves and other allocations with late-successional forest count toward this percentage.” “Retain at least 12 to 18 green conifer trees per acre in regeneration harvest units”. All the action proposals will maintain the required cover in the Connectivity Blocks.

Critical Habitat - Ten of the 15 EA federal sections are within a spotted owl designated Critical Habitat Unit (CHU) OR-36, as defined by USFWS in the January 15 1992 Federal Register. This CHU is not within a large LSR. Intent of the designation is to provide additional linkage and

protection for owls between the large LSRs. The wildlife appendix in the Lost Creek Watershed Analysis provides quotes from the Federal Register to elaborate on management intent for the CHU. Sections included are T33S R 2E Sec 13,23, 24, 25, 26, 27, 35, and T33s R3E Sec 19, 29, 30. The NW Forest Plan was implemented two years later and does not reference CHUs, since the large LSRs serve as block reserves of owl habitat.

The Lost Creek WA identified a concern for maintaining connectivity between large LSRs #224 at Elk Creek and #226 at Middle Fork (Sky Lakes). The recommendation was to maintain greater than the minimum 100 acre core at the more productive owl sites (Taggarts Creek, Blue Goose, Smith Creek), and employ “light touch” marking such as thinning or selective cut (vs GFMA regeneration cut) to maintain more acreage in closer to an older seral character. This marking would slow the deterioration of nesting habitat (as opposed to regen cuts) and maintain the productivity of these owl sites. These recommendations also help comply with the intent of the Critical Habitat designation. There is no policy direction to withdraw additional acreage of suitable habitat.

Some units next to owl cores are being deferred due to soil stability concerns, visual resource management, stands that are lower priority for entry, or to spread out harvest over time. The following suitable habitat acreage (approximate) will be maintained in this sale at these owl cores: Blue Goose site - 275 ac, Smith Creek site - 135 ac, Taggarts Creek site - 300 ac. The Olson Mountain site and Round Mountain site will maintain 100 acres. Alternative 4 (modified ROD) would maintain the most connectivity across the landscape by maintaining 60% canopy closure in selective cut and thinning units.

If the ID team were to defer more units in the current round of sales, the wildlife preference would be to not enter stands next to the Taggarts Creek owl (section 15), and units near the Smith Creek site (west section 18 & 19) to maintain a larger core block than mandated in current policy for Matrix lands. The current proposal for thinning and select cuts will be less impact than regen cuts.

Suitable Habitat: The assumption is that once a suitable habitat unit is thinned or selective cut, the unit becomes dispersal habitat, and does not return to suitable habitat condition for 2 to 10 years. Prey species and undergrowth are disturbed, but once the brush regrows and canopies close back in, the unit will return to suitability. Regen harvest units will not retain enough cover to be dispersal habitat, although the units retaining 18-25 stems will return sooner. All proposed units are currently suitable habitat (McKelvey 1 - nesting habitat, or McKelvey 2 - roosting/foraging habitat). This acreage analysis will focus on the alternative with the heaviest impact to owls, #3 (similar acreage entered as alternative 4, but less canopy closure to be maintained). As the sale plans are firmed up, portions of some units will be deferred from this harvest, so the acreage figures presented here (from early March 98) are the worst-case scenario.

Within the proposed sale sections (6,790 BLM acres in 15 whole or partial sections), there are currently 2,203 acres of McKelvey 1, and 1,887 acres of McKelvey 2, for a total of 60.2% suitable habitat. The sale would alter 927 acres of nesting habitat and 533 acres of roosting/foraging habitat to maintain 38.7% of BLM acres in suitable habitat. 493 acres would be

commercial thin, 636 acres would be selective cut, 218 acres would be regen cut (NGFMA 6-8 tpa retained), and 113 acres would be regen cut more lightly (12-15 tpa to 16-25 tpa).

If comparing before-vs-after just for the Round Forks proposed sale: for 2,880 acres of BLM in 6 sections, pre-sale there are 1,508 acres of McKelvey 1, and 2,880 acres of McKelvey 2, totaling 52.3% in suitable habitat. The sale would remove 531 acres of nesting habitat, and 100 acres of roosting/foraging, to maintain 30.4% in suitable habitat. 257 acres would be commercial thin, 303 acres would be selective cut, and 71 acres would be regen cut (retaining 6-8 tpa). As of this date, units have not been split out between the second and third proposed sales.

Cumulative Impacts: Blowdown salvage from January 1996 storms was harvested (Ground Round sale) in 1997 in the proposed sale sections, with the last of the salvage to be harvested in 1998 (another 0.8 mbf). BLM foresees no other sale activity in the proposed sections in the next 5 years, but there would be potential sales in surrounding sections (Titanic to the east, Lost Creek North to the north and west). Intermingled private industrial timberlands currently contain negligible suitable habitat. Former Medite ownership has been split between four other landowners who are predicted to be entering these private sections in 1998. Scattered blocks of dispersal habitat will remain, but we can't quantify acreage without knowing which stands will be entered and how heavily.

Northern Goshawk

A Federal Register notice on 29 September 1997 began a 12 month review period for analysis by USF&WS for proposed listing as a T&E species. Current guidance in the Medford RMP (pg 57) says "protect all nest sites". Goshawks receive no special status in the NW Forest Plan. BLM's Oregon State Office reissued interim management direction (OR-98-012) on 17 November 1997 outlining policy for Bureau sensitive species which directs that our actions should not contribute to the need to list a species, and that the land allocations in the NW Forest Plan (large LSRs, 100 acre owl cores, Riparian Reserves) should maintain enough suitable habitat to provide for long-term viability of goshawks. Surveys for goshawk and harvest prescriptions are recommended but not mandatory.

All units were surveyed for goshawk presence in July-August 1997 to interagency protocol standards. They will be surveyed a second time in June-August 1998. One nest was discovered in section 29 at Blue Goose, and a 30 acre core has been deferred from the sale. This core augments the adjacent spotted owl core. Some acreage adjacent to the goshawk core is proposed for commercial thinning. As per the recommended OSO guidance, 60% of a 400 acre postfledging area (PFA) will remain unentered and maintain a late seral stage. An April 1 thru August 30 seasonal restriction will be imposed on adjacent units.

There is a high probability that the goshawk pair will build a new nest each year, and could shift their core location up to a half mile. Current OSO policy is to reserve only one core per pair. Due to the size of the adjacent area not being entered near the core, and the thinning nature of the proposed harvest, this pair should remain productive in the vicinity. The E-4 contract stipulation will allow the sale contract to be interrupted if a new nest location is discovered until mitigation

can be devised. Due to their relatively large home range and dispersed density (from studies elsewhere), there is potential for one or two additional goshawk pairs in the analysis area.

Survey and Manage Species

Red Tree Vole

All proposed units below 4300 ft elevation (interagency protocol cutoff) were surveyed to interagency protocol standards in August 1997. There were no detections of new or old vole nests.

Great Gray Owl (a protection buffer species)

Six repetitions of surveys to interagency protocol standards were run in April-June 1997 in all units adjacent to potential habitat (meadows and recent clearcuts). A second year of surveys will be run in April-June 1998. One nest was discovered at Round Mountain (in the vacant spotted owl core) but it failed. Any newly discovered nests will receive a 30 acre core, and a seasonal restriction for a 1/4 mile radius protection buffer from March 1 thru July 15 (ROD pg C-21). Great Grays are difficult to detect, and more pairs could exist in the analysis area. Contract stip E-4 would be used to halt harvest activities until a mitigation plan could be devised.

Great grays are dependant upon meadow-like habitat for foraging. They do not build their own nest, but use an existing platform such as a snap-out top, hollow trunk, or old goshawk nest. The species seems to be adaptable in the type of nest stand used. Since the proposed action calls for mostly thinning and selective cuts, the main disturbance to great grays will be the noise of harvest activity, rather than habitat alteration. Regen cuts will open up meadow-like habitat that promotes access to small mammals that would improve foraging opportunities for the owls. Great grays do not defend a large area, have low site fidelity, and will readily shift cores from year-to-year. Prior to the 1997 survey, there had been no GGO detections in the vicinity, even though there had been seven years of intensive spotted owl surveys, and great grays often respond to spotted owl survey calls. Due to the lack of natural meadows, this vicinity provides medium to low quality great gray habitat.

Amphibians

No Survey & Manage amphibians (Del Norte or Siskiyou salamander) have been detected in the Butte Falls Resource Area or within 25 miles of the analysis area, so protocol surveys are not mandated. Surveys at 8 ponds/pump chances in the watershed were done in 1994 and 1996, with Cascade Frogs discovered at three (one on private, two on BLM). There are no sale units proposed adjacent to these ponds.

Molluscs

Current policy is that for sales advertised prior to FY 99, mollusc surveys are not required. Surveys would be done as required by protocol for any sale which would be advertised in FY 99 and later. There have been no surveys in the analysis area. Snail species such as Megomphix, Monadenia, and Trilobopsis could occur here, as would tail-dropper slugs (Prophysaon). As of this date, there is no policy from the State Office or REO on what mitigation measures are to be

taken if S&M molluscs are discovered.

Other

Big Game

There are resident elk and deer herds, but the analysis area is not designated as any special big-game winter range or management area. A continuing goal is to reduce poaching and human disturbance by blocking road spurs to reduce open road density. Riparian Management areas and owl cores will maintain adequate thermal cover over time. Ongoing harvest on private lands, plus federal regen cuts will maintain early seral stages that provide forage.

Raptors

Osprey - There used to be two active nests in section 15 near the lake. The site at waters edge remains active, but a second site 200 yds uphill was inactive in 1996 & 97. The E-4 contract stip mandates a 5 acre buffer, with seasonal restriction from March 1 through August 31 for a 1/4 mile radius. Helicopter operations would be restricted for 1/2 mile from an active nest until August 1 to minimize disturbance. Osprey require snags and snap-outs for nesting and perching, but have no other dependance on forested habitat.

Coopers Hawk - Young Coopers Hawks were observed in August 97 in a proposed unit in section 19 during goshawk surveys. They were mobile, and a nest could not be identified. The vicinity will be rechecked in June-July 1998. E-4 guidance calls for a 15 acre nest buffer, and a 1/4 mile seasonal restriction from March 1 through July 15. Coopers Hawks are not dependant upon mature stands, and they are capable of building a new nest each year. We have little experience at dealing with Coopers Hawks in timber sales on the district, but the pair will probably shift their location following harvest, then continue to breed in subsequent years.

Sharp Shinned Hawk - During goshawk surveys, two nests were discovered in section 26. A 10 acre core was deferred from the sale for the one nest that was within a proposed unit. As per the E-4 stip, a seasonal restriction from March 1 through July 15 will be imposed on activities within 1/4 mile. Sharp Shinned Hawks prefer younger denser thickets, and are capable of building a new nest each year. The adjacent unit is proposed for an individual tree selection harvest. Sharp Shinned Hawks have not been identified for any special managment status. They have a relatively small home range compared to other raptors, and could occur fairly densely across the forest in a variety of habitats. They should persist as breeders in the vicinity following the sale.

Bats

Three pump chances were mist netted in 1997 in the vicinity, and five species were captured and released: long-eared myotis, long-legged myotis, California myotis, little brown bat, silver haired bat.

Special Habitats

Caves - There is one known cave in the vicinity. Access is difficult, and it has not been explored

for bat presence, and it is at least 500 feet from the nearest proposed unit. There are no known old mine adits. Cliffs - There are several cliffs at the mouth of Red Rock Canyon, but relatively low height (50 ft) and an absence of ledges makes use for raptor nesting unlikely. There are no marshes or large ponds in the area, although there are three pump chance type small ponds. There are no natural wet grassy meadows, but there is a series of steep rocky grassy openings in sections 15 and 21 with oak & manzanita fringes. There are no oak woodland stands.

Snags and Coarse Woody Debris (CWD) - The Ground Round salvage sale in 1997-98 removed 5,3 mmbf of blowdown. Salvage operations were to leave a minimum 120 lineal feet (minimum 16' x 16") of downed logs average per acre on average to meet requirements of the ROD. Snags and snap top trees were left to meet an average of 2 per acre, class 1 & 2. Since most proposed units will be commercial thinning or selective cut, extra standing stems will remain across the landscape to provide future recruitment of snags and cwd.

Wildlife Appendix . Spotted Owl sites in the Lost Creek South EA Vicinity.
 Reproductive status by year updated through the 1997 season.

Site No.	Site Name	Last yr active	Last yr young	92	93	94	95	96	97
0953	Taggarts Creek	97	94	R1	R1	R1	NR	R0	NR
2220	Smith Creek	97	96	R1	NR	R2	NR	R2	NR
1831	Blue Goose	97	97	R2	NR	NR	NR	R1	R2
2359	Round Mountain	92	--	SM	NO	NO	NO	NO	NO
3561	Olson Mountain	97	--	SM	SM	SM	SF	NR	NR

Legend:

- UN Reproduction unknown for year.
- No survey or information, or site not located yet.
- NR Pair present, but not reproductive for year.
- R1 Pair reproductive, followed by number of young.
- NO No response, site presumed not occupied.
- SM Single male.
- SF Single female.

Appendix D

Soils and Watershed

Affected Environment (for Appendices)

Soils

The dominant soil types found within the proposed project area are the Dumont-Coyata soil association and the Freezner-Geppert soil association. These soils are found individually and in complexes throughout the area. These soils have formed in volcanic rocks derived predominantly from andesite. The Dumont-Coyata association differs from the Freezner-Geppert association in having higher rainfall levels and are typically found at higher elevation (2500-4000 feet). The Dumont and Freezner soils are deep (40-60 inches) to weathered bedrock and the Coyata and Geppert soils are moderately deep (20-40 inches) to fractured bedrock and are skeletal (containing greater than 35% rock fragments in the subsoil).

For all these soil types in this project area, soil compaction and surface erosion are the factors most limiting to soil productivity. Also, cobbles and rocks are sometimes found within the surface layer which can restrict the effectiveness of soil tillage operations.

To a lesser extent are the Donegan soils and McMullin soils. These soils are typically found as small outcroppings along ridge tops and knolls. The limiting factors for productivity are shallow soil depths (less than 20 inches) to bedrock and stoniness within the surface layer. (See the Lost Creek Watershed Analysis for further details on soils).

Watershed

The proposed project area lies within the south portion of the Lost Creek Watershed unit. The topography of this area varies from broad gently sloping hillslopes (10-35% slopes) in the Round Mountain vicinity to steep v-shaped canyons (50-80% slopes) tributary to Lost Creek Lake and the South Fork of the Rogue River. Likewise, stream gradients vary from low to very steep depending on the landform.

On the more gentle sloping portions, the dominant cumulative effect on soil and aquatic habitat come from erosion and subsequent sedimentation of stream channels as a result of runoff from an extensive network of skid roads, landings, and natural surfaced roads.

On the areas of steep terrain, the dominant cumulative effect on

stream channels come from sluice-outs (debris slides) as a result of peak flows from high intensity rainstorms. Some of these slides are naturally occurring and others are precipitated by roads or skid roads dissecting through headwalls. No specific data is currently available that quantifies the extent of this effect.

Other small areas(1-2 acres) of potential slope instability exist as evidenced by soil movement (pistol butting, jackstrawed trees, and hummocky ground) and are mostly found in steep headwall areas. Where these unstable areas have been located in proposed harvest units, reserve areas would be delineated. Specifically, in T33S R2E Sec. 13 NW 1/4 unit 002 would defer timber harvest under this proposal due to unstable slopes with a high potential for landslides (approx. 15 acres). This area needs to be considered for future withdrawal from the timber base because it meets the TPCC criteria for fragile slopes.

Another watershed issue is the decommissioning and hydrologic recovery of roads in order to reduce road related risk of erosion and high stream flows and meet the Aquatic Conservation Strategy of the ROD. There are currently many opportunities to reduce road densities specifically unsurfaced roads and jeep roads in this proposed project area. Due to road use agreements with private timber companies in this area it is not known at this time exactly how much road decommissioning would occur. However, it is anticipated that there will be an overall net reduction in road densities for all the proposed action alternatives. For specific proposals for decommissioning, renovation, improvements, and construction of roads see Table 2 of the E.A. (See the Lost Creek watershed Analysis for further details on watershed description).

Issues to be Analyzed

Issue 2: Transient Snow Zone (TSZ)

The TSZ is an elevation band (3500-4500 feet) where snow pack can accumulate and is at a high risk for a rain-on-snow occurrence. Typically, rain-on-snow events produce flood conditions which can severely alter stream channel morphology and degrade aquatic habitat.

Activities such as timber harvest and road and landing construction create openings in the tree canopy where snow can accumulate. This increases the magnitude of runoff in a potential rain-on snow event. Typically, a canopy cover of 60% or more is considered adequate to reduce this potential effect. Through cumulative effects analysis of the watershed compartments

in this project area, it has been determined there are a substantial amount of non-recovered openings (less than 60% canopy cover) in the TSZ as a result of past timber harvest activities (particularly on privately owned timberlands). This creates a high level of risk for a rain-on-snow occurrence and the subsequent degradation it can cause.

Indicators for measuring this issue are:

-acres of newly created openings (less than 60% canopy closure) from the proposed action alternatives

III. Affected Environment

2. TSZ (see issues to be analyzed and appendices for soil and watershed description)

IV. Environmental Consequences of Alternatives

Effects From Implementing Alternative 1--No Action

2. TSZ

a) Direct and Indirect Effects

None anticipated

b) Short-term Uses vs. Long-term Productivity

None anticipated

c) Irreversible/Irretrievable Commitment of Resources

None anticipated

d) Cumulative Effects

There would be no change in the existing condition, however, the proposal to reduce road densities and their subsequent adverse effects may not occur.

Alternative 2 (ROD Standards and Guides)

2. TSZ

a) Direct and Indirect Effects

This proposed alternative would increase the amount of TSZ openings (Less than 60% canopy closure) by 898 acres. This would increase the risk for higher magnitude and frequency of peak

flows in local stream channels. These high flows can alter stream morphology and degrade aquatic habitat. Quantification of the effects of this proposal are not currently known.

b) Short-term Uses vs Long-term Productivity

The long-term productivity (greater than 10 years) of stream channels (aquatic habitat) within the project area can be adversely effected if a rain-on-snow flood were to occur.

c) Irreversible/Irretrievable Commitment of Resource

None anticipated

d) Cumulative Effects

See direct and indirect effects.

Alternative 3 (Canopy Retention alternative)

2. TSZ

a) Direct and Indirect Effects

All proposed harvest units in the TSZ would maintain a 60% or greater canopy closure, therefore no anticipated direct or indirect effects on TSZ openings would occur.

b) Short-term Uses vs. Long-term Productivity

None anticipated

c) Irreversible/Irretrievable Commitment of Resources

None anticipated

d) Cumulative Effects

Maintaining 60% or greater canopy in all harvest units within the TSZ would allow more time for other cut over areas to continue to revegetate (increase canopy closure) and reduce the overall risk of a high amount of TSZ openings.

Alternative 4 (Modified)

2. TSZ

a) Direct and Indirect Effects

This proposed alternative would increase the amount of TSZ openings (Less than 60% canopy closure) by 200 acres. This would increase the risk for higher magnitude and frequency of peak flows in local stream channels. These high flows can alter stream morphology and degrade aquatic habitat. Quantification of the effects of this proposal are not currently known.

b) Short-term Uses vs Long-term Productivity

The long-term productivity (greater than 10 years) of stream channels (aquatic habitat) within the project area can be adversely effected if a rain-on-snow flood were to occur.

c) Irreversible/Irretrievable commitment of Resources

None anticipated

d) Cumulative Effects (see direct and indirect effects)

Appendix E - ALTERNATIVES CONSIDERED BUT ELIMINATED

ALTERNATIVE A-1 - Approximately 397 acres of matrix lands were originally considered for harvest entry but eliminated from consideration due to current stand conditions, inaccessibility, unstable soils or wildlife concerns. All or portions of the following operational inventory units were deferred from entry at this time.

Township-Range-Section	OI Unit	Acres	Remarks
33S-2E-11	002	40	Retain to meet Visual Resource Management (VRM) objectives (maintain 60-70% canopy closure), current stand condition at 70%+ canopy closure. Soil stability of concern on steep slopes adjacent to Riparian Reserves.
33S-2E-11	006	16	Retain to meet VRM objectives (maintain 60-70% canopy closure), current stand condition at 70%+ canopy closure. Soil stability of concern on steep slopes adjacent to Riparian Reserves.
33S-2E-12	001	22	Stand conditions, scattered overstory DF with madrone occupying the understory. Maintain for landscape diversity and canopy closure.
33S-2E-13	002A	15	Complex of Riparian Reserves, with small matrix strips in between. Benches common indicating soil movement and instability. A slide area is present adjacent to a spring. ID team proposal is to drop from base.
33S-2E-13	002C	40	Scattered vigorous DF overstory, brush occupies second level with white fir seedling to sapling underneath. Precommercial size conifers adjacent to old clearcut on the north end, maintain for structural diversity. Hemlock patch on flat adjacent to Riparian Reserve, retain for diversity as well as to minimize increasing an already high water table.
33S-2E-21	001	31	Steep slope with scattered vigorous large DF overstory. Madrone occupies the understory in large patches. Maintain for VRM & landscape diversity.

33S-2E-23	008D	21	Adjacent to regeneration harvest. Mistletoe scattered in DF. Maintain intact for canopy closure & wildlife habitat.
33S-2E-23	008B&C	30	Strips retained to enhance adjacent Riparian Reserves and to maintain structural diversity in areas adjacent to regeneration harvests.
33S-2E-26	004	15	Wildlife buffer.
33S-2E-27	005	8	Vigorous second growth stands. Maintain closed canopy patches for landscape diversity.
33S-3E-18	002	10	Open canopy, widely spaced DF generally of good vigor, Madrone is present. Stand is adjacent to late successional reserve. Leave intact to enhance wildlife habitat.
33S-3E-18	002	2	Vigorous second growth stands. Maintain closed canopy patches for landscape diversity.
33S-3E-19	002	4	Logging access would require a road to be built down the ridgeline between two Riparian Reserves for cable system access. Decision minimize impacts by tractor yarding from ridgeline and leave remaining matrix land for an enlarged Riparian Reserve and additional wildlife habitat.
33S-3E-19	002	2	Logging access would require a road to be constructed to cable yard. Decision: minimize site impacts and leave for riparian and wildlife values.
33S-3E-19	002	13	Unstable slopes. ID team proposed to drop from base. This area will also enhance late-successional buffer on the north side.
33S-3E-29	003	116	Stand condition and density levels generally good. No entry at this time.
33S-3E-29	006	14	Wildlife buffer
	TOTAL	397	

APPENDIX F - SILVICULTURAL PRESCRIPTION & MARKING GUIDELINES

SILVICULTURAL PRESCRIPTION - LOST CREEK SOUTH TIMBER SALES MANAGEMENT DIRECTION AND OBJECTIVES

Management Direction

To harvest timber on matrix lands as provided for under the Medford District Resource Management Plan and the Record of Decision for the Northwest Forest Plan.

Treatment Objectives

The objectives of a harvest entry in the Lost Creek watershed area at this time are:

1. To favor a return to the seral phase of the white fir series as a long term silvicultural approach to provide for sustainable forest conditions. Potential climatic change may alter conditions on these sites such that the future sustainable vegetation may be the more drought tolerant seral phases of the white fir series. Favored species should be the shade intolerant and intermediates, ponderosa pine, sugar pine, incense cedar, Douglas-fir and hardwood species. Of particular concern is maintaining pine species on sites 3500 feet and less.
2. To maintain at least 60% canopy closure in all thinned and selectively cut stands. This level of canopy closure will provide for connectivity and a variety of plant and animal habitat across the landscape.
3. To thin from below in merchantable second growth stands, to redistribute growth to vigorous dominant and co-dominant trees.
4. To reduce density levels towards the carrying capacity of the site. In selectively cut stands, remove individual trees across all diameter classes to reduce inter-tree competition while maintaining or promoting the development of multiple canopy layers.
5. To regenerate deteriorating stands and stands with Douglas-fir infected with dwarf mistletoe; and to prepare units for seedling establishment and growth by providing suitable site conditions for planting.
6. To maintain coarse woody debris, snags and large green conifers for long term site productivity and biological legacies.
7. To return areas of diminished conifer productivity to their full, long term capability.

SITE/STAND DESCRIPTION

1. General Description of the Site

The proposed sale area is located in portions of Sections 11, 13, 15, 21, 23, 24, 25, 26, 27 and 35 in Township 33S, Range 2E and Sections 18, 19, 29, 30 and 31 in Township 33S, Range 3E.

2. Abiotic Conditions

a. Soil types - Three soil types are present within the sale area, the Dumont/Coyota, Freezner-Geppert and Donegan associations. The dominant soil type is the Dumont and Coyota association. Dumont soils are very deep (up to 60"), well drained and have a high clay content. Coyota soils are moderately deep and well drained. The Freezner-Geppert soils occupy the

western portion of the sale area and are defined as 60% Freezner soils and 35% Geppert soils with 5% inclusions. Freezner soils are very deep, well drained and have a clay loam subsoil. The Geppert soil is moderately deep and is skeletal (>35% rock fragments in the subsoil with a extreme cobbly clay subsoil. Donegan soils are present in the upper elevations of the sale area and are moderately deep (20-40") and well drained.

b. Topography - The landform within this area is highly variable and ranges from very steep to moderate to gentle slopes and not highly dissected. The elevational range is approximately 2300-4900 feet ASL. Annual precipitation ranges from 35" - 50". Most of the precipitation occurs in the late fall, winter and early spring as rainfall with the exception of the higher elevations where snow accumulates.

c. Potential site problems - Root diseases, dwarf mistletoe, windthrow and pocket gophers are of concern within the sale area. Laminated root rot is present in small pockets. Laminated root rot is a disease of the site and infects trees of all vigor classes. Dwarf mistletoe is present in some stands affecting Douglas-fir and white fir. Windthrow on moderately deep soils (the underlying bedrock restricts root growth) is also of concern, particularly on ridges, in saddles and in stands where the trees have a height to diameter ratios of 80 or more. Pocket gopher populations vary, from endemic levels to moderately high levels. Varying amounts of seedling mortality has occurred in plantations due to pocket gophers.

High growing season temperatures and high evaporative demands are typical on the lower elevations of the sale area. These conditions result in a decrease in moisture availability which may result in an increased susceptibility of trees to insects, disease and competition related mortality.

d. Site Index - The average site index within the sale area is 90 for Douglas-fir, based upon Hann-Scrivani site index equations with a base age of 50 years. Site index is the average height of dominant trees at age 50. Height growth of dominant trees is relatively independent of stand density and therefore can be used as a measure of site productivity.

3. Biotic Conditions

a. Plant associations - The north/south orientation of the Cascade Mountains, provides the environmental gradient that influences the presence and abundance of vegetative species. Slope, aspect, elevation, soil depth and geology further define the extent and occurrence of various species. Within the proposed Lost Creek watershed timber sale area, white fir is the dominate plant series. The white fir series is one of the most widespread, diverse and productive plant series of the southern Oregon Cascades. Ponderosa pine, sugar pine, incense cedar, and Douglas-fir represent the early seral component of this series. Douglas-fir generally dominates the overstory of most stands before being replaced by white fir.

The majority of the sale area contains plant communities that are near the middle of the environmental gradient for the white fir series. Indicators of cold sites (mountain hemlock, Pacific silver fir, and Shasta red fir) are absent as are hot site indicators (California black oak and poison oak), except on the lowest elevations of the sale area. Moisture is available through the early part

of summer, but it becomes limiting in the mid summer before low temperatures decrease biomass production. The understory is dominated by white fir, with Douglas-fir common. White fir, Douglas-fir, incense cedar, western hemlock and sugar pine will invade the site following disturbance. Hardwoods present include minor amounts of California black oak (lowest elevations), madrone in areas of relatively recent fires and golden chinkapin on shallow rocky soils. Shrub competition is generally moderate to severe following site disturbance in which the overstory canopy is opened up (<60% crown closure). Vegetative management will be required to insure successful establishment and growth of conifer regeneration. Shrub species, particularly vine maple provides a heavy understory cover. Other shrub species present in varying amounts include, deerbrush ceanothus, oceanspray, vine maple, hazel, red stem ceanothus, oregongrape and thimbleberry. Common herbaceous vegetation includes, vanillaleaf, catchweed bedstraw, pathfinder, western starflower, western twinflower and white inside-out flower.

b. Stand history - Historically, fire was the primary large scale natural disturbance event. Within the sale area, the majority of fires were intense stand replacement fires. Light underburns occurred occasionally, with the last disturbances estimated at 70-130 years. Fires were more frequent in the lower elevation zones of the sale area where high temperatures, moderate precipitation and low fuel moisture are common during the summer. Fire intensities can be influenced by slope, aspect, fuel arrangement and fuel moisture content. These conditions affect fire behavior and can regulate the intensity and severity of fires. Generally, north slopes had stands that were multi-layered as a result of lower intensity fires. Whereas, south aspects had more singled-layered stands due to moderate or higher intensity fires.

During the past 70 years, logging has replaced fire as the primary event that has shaped stand condition and structure. The most recent entries occurred during the late 1980's.

c. Structure Description - The structural characteristics of the stands within the proposed sale area are either single canopy even-aged stands or multi-canopy stands. Widely scattered 50"+ Douglas-fir trees are also present in some of the younger even-aged stands, fire remnants of previous stands.

d. Insect, Disease, Pocket Gophers and High Stand Densities

Root pathogens are not a widespread problem but do occur in the area. Infection centers of *Phellinus weirri* root pathogen are present. Small pockets of white fir and Douglas-fir are affected.

Douglas-fir mistletoe and white fir mistletoe is present and affecting tree vigor. Mistletoe is host specific and may cause: tree mortality, growth loss, alteration of crown and canopy structure, increased fire hazard and increased susceptibility to bark beetles, root rots and drought.

Pocket gopher populations are variable within the proposed sale area and are dependant upon the availability of herbaceous food sources. Creation of favorable gopher habitat will be discouraged by minimizing the creation of canopy openings, maintaining canopy closure and limiting soil disturbance. Site preparation will be a combination of lopping and scattering, slashing and handpiling, excavator piling, and burning of piles. These methods will minimize the re-initiation

of early seral herbaceous vegetation.

Stand densities are currently very high, >60%RD. Inter-tree competition for limited site resources has resulted in declining tree vigor and growth, tree mortality and an increased susceptibility of trees to insect attack, disease infection, and fire intensity.

e. Coarse woody debris (CWD) - Transects were completed within the sale area. The amount and decay classes of woody debris reflects the stage of stand development. In a natural cycle, two stages of stand development typically have the greatest amounts of CWD. Those stages are, stand initiation following a stand replacement event and as the old growth phase.

The objectives within the treatment area are: 1). In the younger stands maintain existing levels as they currently are. 2). In stands proposed for regeneration harvest to create or maintain 120 linear feet of logs per acre greater than or equal to 16 inches in diameter and 16 feet long, decay class 1&2.

f. Snags - The kind and amount of snags varies depending on the stage of stand development. Under natural processes, early and old growth stands typically have the greatest amounts of stage 1&2 snags. In late seral stands, the snag component is usually variable with the majority in stages 3, 4 & 5. The objective of this prescription is to retain all stage 1&2 snags for wildlife and future coarse woody debris. The only instances where stage 1 snags may be removed in areas are when they are a safety hazard. In regeneration harvest stands, the target level of snags is 1.8 snags per acre.

ANALYSIS IN SUPPORT OF THE PRESCRIPTION

The target stand reflects not only what is planned for the future but also what is expected immediately after treatment. The target stand represents optimum conditions to strive for through management.

1). Target Stand - Selective Cut (SC)

Stands: T33S 2E, 11-006, 13-002A, B & C, 15-008, 21-001, 21-003, 27-005.
T33S 3E, 18-002, 19-001A, B, C & D, 19-002A, B, C & D, 30-001A, 30-001B,
31-012A and 23-008C.

Immediately following the harvest entry, these stands are composed of the most vigorous trees of all species and diameter classes. Large healthy ponderosa pine have been released to insure their continued presence in the stand. Species composition is dominated by Douglas- fir, followed by white fir and smaller amounts of ponderosa pine, sugar pine and incense cedar. All hardwoods have been left. Vertical and biological diversity is present through the retention of healthy trees of all age and size classes. Basal area has been regulated to reduce density levels towards the carrying capacity of the site. Growth rates and individual tree vigor has been increased due to the greater availability of moisture and nutrients for the residual trees. Underplanting of Douglas- fir has occurred where the brush component has been excavator piled. Basal area is approximately 140-220 sq. ft. with canopy closure approximately 60% or greater. Coarse woody debris (CWD) is present and provides conditions favorable for nutrient recycling, soil mychorrizae, and the development of nitrogen fixing bacteria. Cull trees have been left to insure that a near-term "pulse" of CWD and snags will be available.

YEAR	SELECTIVE CUT TREATMENT
0	<ul style="list-style-type: none"> * Initial harvest - reduce stand densities by marking trees across all diameter classes up to, but not including, 50" dbh . Tree vigor is the primary factor in determining the trees to remove. Trees in excess of 50" dbh may only be removed if they are heavily infected with mistletoe (mistletoe rating >4) and threaten the health of the surrounding stand. Leave mistletoe infected trees > 50" dbh that are located in topographic positions that are not conducive to the spread of the disease. Such as, draws, lower slopes of units and in areas that all adjacent trees are non-host species. Exception: Unit 23-008C, trees larger than 50" dbh may be marked if exhibiting deteriorating crown and tree conditions. * Use widely spaced designated skidtrails or corridors, directional falling and log length skidding to reduce site impacts. * Treat logging slash and where necessary existing brush and hardwoods. Methods may include: slashing brush and hardwoods and handpiling and burning or lopping and scattering heavy slash concentrations, refer to the attached stand treatment recommendations.
0-1 10-20	<ul style="list-style-type: none"> * Slash all sprung or severely damaged conifers and hardwoods between 1&6" * Plant Douglas-fir in stands where brush has been treated. * Where necessary, seedlings and saplings in the understory have been thinned and released from brush competition. * Conduct stand exam to assess stand conditions and to determine if any additional management treatments are needed.

Selective Cut (SC) - Silvicultural Options Considered:

The silvicultural prescription process considered other harvest methods as well as no action.

Existing stand condition: In the stands recommended for selective cut, a large percentage of the trees have good crown ratios and vigor; a smaller percentage of the trees are showing symptoms of decline (poor crown ratios & chlorotic thinning foliage). As stands age, moisture stress problems and consequent mortality increase for the following reasons: 1). Decreased water conductance and other physiological problems increase with tree size and age making older trees more susceptible to drought and other stress factors (insects and disease). 2). The amount of photosynthate required to meet the respiratory requirements of a tree increases with tree size, making less of the energy available for growth or to withstand stress. The energy required to maintain the life of trees or of stands increases rapidly with air temperature and with tree size. 3). As shade tolerant tree species invade the understories of stands, competition for site resources (moisture and nutrients) increases, leading to the mortality of overstory trees because their respiratory requirements can not be met. 4). Unlike shade intolerant species (pine species, Douglas-fir), shade tolerant species (white fir, western hemlock) tend to allocate more of their

net photosynthates to leaves, less to roots, and have lower carbohydrate reserves that can be used to withstand stress. As a result, shade tolerant trees often die of moisture stress at sizes well below the sizes at which the respiratory requirements of large shade intolerant trees would be met.

Based upon the existing stand conditions a regeneration harvest is not recommended for these stands. With healthy overstory trees as well as variable amounts of understory trees a healthy stand can remain following entry. Stand densities will also be reduced, freeing up site resources (water & nutrients) for the remaining trees. The post harvest stand would be more vigorous and resilient to environmental stresses (drought, insects, disease, climate change).

2). Target Stand - Regeneration Harvest (RH)

Three different regeneration silvicultural methods will be implemented, Structural Retention, Modified Even-aged and Connectivity Modified Even-aged. The target stand conditions for each of these methods are the same, except for the number of trees greater than 20 inches in diameter at breast height (dbh) that are left. Listed below are the number of trees > 20" dbh that are to be left.

Structural Retention - 16-25 trees/acre > 20" dbh.

Stands: T33S R2E, 13-002D

Connectivity Modified Even-aged - 12-18 trees per acre >20" dbh.

Stands: T33S R2E, 15-008A and 15-008B.

Modified Even-aged - 6-8 trees/acres > 20" dbh.

Stands: T33S R2E, 13-00R, 13-002, 21-003R, 27-005R, 23-008A, B & D and 26-004R

T33S R3E, 18-002R, 19-001R, 19-002R, 30-001 and 30-003

(Target number from above) green conifers/acre, greater than 20" dbh remain following entry. Healthy Douglas-fir, ponderosa pine, white fir, incense cedar and sugar pine will be favored to leave as the overstory trees greater than 20" dbh. Additionally, all vigorous ponderosa pine, Douglas-fir, incense cedar, sugar pine and hardwoods regardless of size would be left unless thinning of pockets is appropriate. All of the smaller diameter white fir 8-20" would be removed unless needed to meet the target canopy closure. Basal area immediately following entry would be approximately 50-130 square feet, with canopy closure 15% to 40%. In addition to stage 3,4 & 5 snags a minimum of 1.8/acre stage 1&2 snags are present. All decay classes of coarse woody debris are present (either standing or down) with a minimum of 120 linear feet of decay class 1&2. Site preparation has included shrub control and slash treatment by excavator piling from designated skidtrails or slashing of brush and hardwoods and handpiling and burning. Skidtrails have been ripped. These units have been planted with a mix of conifer species. Species diversity is present with Douglas-fir, ponderosa pine, sugar pine, and incense cedar. Stand density would be periodically regulated by precommercial thinning and commercial thinning entries. Approaching age 100, this stand is a fully stocked stand of healthy, vigorous dominant and co-dominant second growth trees with scattered large remnants. Stocking would be approximately 35% relative density (185 SDI).

REGENERATION HARVEST	
YEAR	TREATMENT
0	<ul style="list-style-type: none"> * Harvest - Leave target number of green conifer trees/acre, >20" dbh and all vigorous ponderosa pine, Douglas-fir, incense cedar, sugar pine and hardwoods 8-20" dbh. * A minimum of 1.8 snags/acre (stage 1&2) and 120 linear feet coarse woody debris (decay class 1&2, 16" X 16') would be left. * Use widely spaced designated skidtrails, directional falling and log length skidding to reduce site impacts. * Site preparation: Slash trees damaged from logging activities, 1-6". Leave all other healthy unmerchantable trees. Brush and hardwoods are to be treated either by excavator removal or slashing. Excavator or handpile brush and slash and burn. Limit piling of logging slash to pieces < 16" diameter. * Rip skidtrails
0-1	<ul style="list-style-type: none"> * Plant with a mix of ponderosa pine, Douglas-fir, sugar pine and incense cedar. Apply appropriate maintenance (vexar tubing, mulching, shading, scalping, baiting) treatments to insure planting success.
1	<ul style="list-style-type: none"> * Conduct 1st year survival survey, assess need for supplemental planting or additional maintenance treatment.
3	<ul style="list-style-type: none"> * Conduct 3rd year survey, assess need for replanting and/or additional maintenance needs.
5	<ul style="list-style-type: none"> * Conduct 5th year stocking survey. Target stand will have a minimum a 280 well spaced trees per acre. Competing vegetation will have been controlled, with trees growing rapidly.
10	<ul style="list-style-type: none"> * Precommercial thin the understory if more than 400 trees per acre are present.
35	<ul style="list-style-type: none"> * Average diameter at breast height is 10", commercial thin if stand density is appropriate, otherwise delay until crown closure and competition reduces growth rates.
45-80	<ul style="list-style-type: none"> * Commercial thin if appropriate, consider underburning to provide nutrient "pulse" and for regulating understory seedling and sapling component.
100+	<ul style="list-style-type: none"> * Assess stand and watershed conditions for possible regeneration harvest.

3). Target Stand - Shelterwood Retention

Stand: T33S R2E, 35-004

12-25 green conifers/acre, greater than 20" dbh remain following entry. Healthy Douglas-fir, ponderosa pine, white fir, incense cedar and sugar pine will be favored to leave as the overstory trees greater than 20" dbh. Additionally, all vigorous ponderosa pine, Douglas-fir, incense cedar, sugar pine and hardwoods regardless of size would be left unless thinning of pockets is appropriate. . All of the smaller diameter white fir 8-20" would removed unless needed to meet canopy closure targets. Basal area would approximate 80-100 square feet, with canopy closure 25% or greater. Trees smaller than 20" dbh would be an important component towards meeting the desired canopy closure. In addition to stage 3,4 & 5 snags a minimum of 1.8/acre stage 1&2 snags are present. All decay classes of coarse woody debris are present (either standing or down) with a minimum of 120 linear feet of decay class 1&2. Site preparation has included shrub control and slash treatment by excavator piling from designated skidtrails or slashing of brush and hardwoods 1-5" and handpiling and burning. This unit have been planted with a mix of conifer species. Species diversity is present with Douglas-fir, ponderosa pine, sugar pine, and incense cedar. Once the understory is established and has reached the point where mortality due to pocket gophers is minimal , approximately 15-30 years, overstory trees in excess of 6-8 trees/acre may be removed. Stand density would be periodically regulated by precommercial thinning and commercial thinning entries. Approaching age 100, this stand is a fully stocked stand of healthy, vigorous dominant and co-dominant second growth trees with scattered large remnants. Stocking would be approximately 35% relative density (185 SDI).

SHELTERWOOD RETENTION

YEAR	TREATMENT
0	<ul style="list-style-type: none"> * Harvest - Leave 12-25 green conifer trees/acre, >20" dbh and all vigorous ponderosa pine, Douglas-fir, incense cedar, sugar pine and hardwoods 8-20" dbh. Smaller diameter white fir 8-20" would be removed unless needed to meet target canopy closures. * A minimum of 1.8 snags/acre (stage 1&2) and 120 linear feet coarse woody debris (decay class 1&2, 16" X 16") would be left. * Use widely spaced designated skidtrails, directional falling and log length skidding to reduce site impacts. * Site preparation: Slash trees damaged from logging activities, 1-6". Leave all other healthy unmerchantable trees. Treat brush and hardwoods by excavator removal or slashing. Excavator pile slash and brush and burn. Limit piling of logging slash to pieces < 16" diameter. * Rip skidtrails
0-1	<ul style="list-style-type: none"> * Plant with a mix of ponderosa pine, Douglas-fir, sugar pine and incense cedar. Apply appropriate maintenance (vexar tubing, mulching, shading, scalping, baiting) treatments to insure planting success.
1	<ul style="list-style-type: none"> * Conduct 1st year survival survey, assess need for supplemental planting or additional maintenance treatment.
3	<ul style="list-style-type: none"> * Conduct 3rd year survey, assess need for replanting and/or additional maintenance needs.
5	<ul style="list-style-type: none"> * Conduct 5th year stocking survey. Target stand will have a minimum a 280 well spaced trees per acre. Competing vegetation will have been controlled, with trees growing rapidly.
10	<ul style="list-style-type: none"> * Precommercial thin the understory if more than 400 trees per acre are present.
15-30	<ul style="list-style-type: none"> * Assess the potential to remove trees in excess of 6-8/acre.
35	<ul style="list-style-type: none"> * Average diameter at breast height is 10", commercial thin if stand density is appropriate, otherwise delay until crown closure and competition reduces growth rates.
45-80	<ul style="list-style-type: none"> * Commercial thin if appropriate, consider underburning to provide nutrient "pulse" and for regulating understory seedling and sapling component.
100+	<ul style="list-style-type: none"> * Assess stand and watershed conditions for possible regeneration harvest.

Regeneration Harvest (Structural Retention, Modified Even-aged, Connectivity Modified Even-aged and Shelterwood Retention) - Silvicultural Options Considered:

Existing Conditions: The overstory in many stands exhibit declining characteristics, such as, poor crown conditions, low crown ratios, poor growth rates and mistletoe infestation. White fir where it occupies the dominant and co-dominant crown position is often of declining vigor. The understory is predominantly scattered or clumped small white fir 1-6" in diameter.

Uneven-aged Regeneration Options:

Neither individual tree selection nor group selection are desirable due to the structure, vigor and species composition of the existing stands. These types of methods would further encourage the establishment and growth of undesirable white fir and an increase in mistletoe infection.

Intermediate Treatment Options:

Commercial thinning is not appropriate due to the advanced age, structure, poor vigor and current stand density within the units.

4). Target Stand - Commercial Thinning (CT)

Stands: T33S R2E, 15-007, 23-006, 23-008, 24-001, 24-002, 24-003, 25-004, 26-004, 27-003, 27-004.
 T33S R3E, 19-002, 29-003, 29-007, 31-012.

Immediately following the harvest, these stands will have density levels that near the carrying capacity of the site. Species composition is well represented with Douglas-fir, ponderosa pine, sugar pine, incense cedar and white fir. Hardwood species occur as an occasional stand component either singly (California black oak) or in clumps (madrone or chinkapin). Trees sizes include seedlings, saplings, and small and large conifer trees. The residual merchantable trees (>8" dbh) are characterized by co-dominant or dominant attributes, such as, crown ratios greater than 35%, good growth rates and larger diameters. The mosaic of size classes provides the structural diversity. These stands will possess late successional characteristics with growth accelerated. Crown closure will be approximately 60% or greater, with basal area ranging from 140-200 sq.ft.. The amount of coarse woody debris (CWD) will be dependant upon the current levels, availability of overstory snags, and residual green trees. Stage 1 and 2 snags will remain for wildlife. Large fire remnant trees generally >200 years and >42-50" dbh will be a scattered stand component.

YEAR	TREATMENT
0	* Initial harvest - thin from below, favor seral species, utilize relative density of 35%, 40% or 45%. * Use widely spaced designated skidtrails, directional falling and log length skidding to reduce site impacts. * Lop and scatter heavy slash concentrations. * Slash all sprung or severely damaged conifers and hardwoods between 1&6"
10-20	* Conduct stand exam to assess stand conditions and to determine if any additional management treatments are needed.

POTENTIAL FOR "AVOIDANCE" VEGETATION MANAGEMENT STRATEGIES:

The objectives of vegetative management are:

- to improve early soil moisture conditions by eliminating or reducing the transpirational demands of competing brush and herbaceous vegetation.
- to improve survival by manipulating the distribution, density and composition of competing vegetation.
- to create access for tree planting and subsequent silvicultural treatments.
- to increase site productivity and tree growth leading to a reduction in rotation length.
- to reduce the risk of wildfire.

With these objectives in mind, possible avoidance or prevention strategies are formulated. Under these strategies, control of vegetation relies in total or in part on habitat modifications or the complementing of natural ecosystems and processes. Method considered fall under three categories:

1. Manipulation of cutting methods -- partial cutting methods which retain sufficient canopy to reduce/prevent understory shrub growth yet still provide conditions suitable for tree growth or regeneration (natural or artificial).
2. Intensive methods -- fire, mechanical (cat piling/excavator piling/scarification/ripping), handtools (brushing).
3. Combinations of 1 & 2.

For the Lost Creek watershed timber sale, vegetation control is tied to the cutting method and the retention of sufficient canopy to preclude the establishment if excessive amounts of competing shrubs. Within the regeneration harvests excavator and handpiling of brush greater than 1 inch in diameter would occur.

MONITORING

Implementation of the standard and guidelines in the Record of Decision (ROD) and management direction contained within the Medford District Resource Management Plan and Final Environmental Impact Statement (RMP/FEIS) require a monitoring system to insure effective on-the-ground results. The ROD states the following: "Monitoring is an essential component of natural resource management because it provides information on the relative success of management strategies. The implementation of these standards and guidelines will be monitored to ensure that management actions are meeting the objectives of the prescribed standards and guidelines, and that they will comply with laws and management policy. Monitoring will provide information to determine if the standards and guidelines are being followed (implementation monitoring), verify if they are achieving the desired results (effectiveness monitoring), and determine if underlying assumptions are sound (validation monitoring). Some effectiveness and most validation monitoring will be accomplished by formal research."

Monitoring of the proposed actions will follow the outline in the Medford District RMP/EIS, Volume II, Appendices 147-163. Monitoring will be specific to the land allocations and resources affected in the Lost Creek watershed sale area.

Monitoring should:

- * Detect changes in ecological systems from both individual and cumulative management actions and natural events
- * Provide a basis for natural resources policy decisions
- * Provide standardized data
- * Compile information systematically
- * Link overall information management strategies for consistent implementation
- * Ensure prompt analysis and application of data in the adaptive management process
- * Distribute results in a timely manner

Monitoring begins with resource assessment and data collection which describes the existing

conditions prior to management actions. Data collection is in the form of sampling which provides a representative description of the proposed treatment area. Stand exams were completed in the proposed sale area. Stand information was collected, using a comprehensive stand exam process. Within stands, a systematic sampling grid was used to establish plot centers. From the plot centers a variable plot and two nested fixed plots were used to record tree data.

Information collected included:

- tree growth
- presence of insects or disease
- stand structure (tree height, diameter, crown ratio)
- species composition for all vegetation (trees, shrubs, herbaceous vegetation).
- coarse woody debris (diameters, length, decay class)
- canopy closure
- aspect, percent slope and topographic position
- snags (diameter, height and decay class)
- shrub and herbaceous vegetation (species, percent cover, location by slope and aspect)
- site index tree to determine site class/potential.

This information is then used in a BLM stand exam program that provides a variety of analysis reports. These reports provide a description of stand characteristics and a detailed assessment of stand conditions and health.

Post harvest monitoring can then be implemented, using the pre-harvest stand information to determine if the objectives have been met.

STAND TREATMENT RECOMMENDATIONS - LOST CREEK SOUTH - ROUND FORKS

TOWNSHIP	RANGE	SECTION	OI	NET ACRES	PRESCRIPTION	LOGGING SYSTEM	SLASH TRT-SITE PREP REFORESTATION NEEDS
33S	2E	24	002	24	COMMERCIAL THIN	T	HP&B
33S	2E	25	004	27	COMMERCIAL THIN	T	LS
33S	3E	18	002	42	SELECTIVE CUT	C & BL	LS(35), S,HP&B(7),P(7)
		18	002R	2	6-8 REGEN	C	S, HP&B, P
		19	001 A,B,C,D	113	SELECTIVE CUT	C(64) & T(49)	LS(64), EX BRUSH(49), P(49)
		19	001R	18	6-8 REGEN	C(5)& T(13)	S, HP&B(5), EX, R(13),P
		19	002 A,B,C,D	111	SELECTIVE CUT	C(53) & T(58)	LS(53), EX BRUSH(58), P(58)
		19	002	4	COMMERCIAL THIN	C	UB
		19	002R	13	6-8 REGEN	C	UB, P
		29	003	61	COMMERCIAL THIN	T	LS
		29	007	56	COMMERCIAL THIN	T	LS
		30	001	4	6-8 REGEN	C	UB, P
		30	001A	36	SELECTIVE CUT	C(16)& T(20)	LS
		30	001B	54	SELECTIVE CUT	T	LS
		30	003	17	6-8 REGEN	T	EX, R, P
		31	012	21	COMMERCIAL THIN	T	LS
		31	012A	5	SELECTIVE CUT	T	LS
				608 ACRES	SELECTIVE CUT: 361 REGEN HARVEST: 54 COMM. THIN : 193	CABLE: 203 AC TRACTOR: 405	LS: 412 ACRES S, HP&B: 14 EX&R: 30 EX: 107 BB: 21 HP&B: 24 P: 178

LOST CREEK SOUTH - "B" LOST

TOWNSHIP	RANGE	SECTION	OI	NET ACRES	PRESCRIPTION	LOGGING SYSTEMS	SLASH TRT -SITE PREP REFORESTATION NEEDS
33S	2E	15	007	10	COMMERCIAL THIN	C	LS
		15	008A	10	12-18 REGEN	T	EX,R,P
		15	008B	23	12-18 REGEN	C(11)& T(12)	S,HP&B(11),EX,R(12),P
		23	006	24	COMMERCIAL THIN	T	LS
		23	008	13	COMMERCIAL THIN	T(13)	LS
		23	008 A,B,D	70	6-8 REGEN	T	EX, R,P
		23	008C	32	SELECTIVE CUT	T	LS
		24	002	24	COMMERCIAL THIN	T	HP&B
		24	003	21	COMMERCIAL THIN	T	HP&B
		25	004	35	COMMERCIAL THIN	T	LS
		26	004R	5	6-8 REGEN	T	EX, R,P
		26	004	30	COMMERCIAL THIN	T	EX BRUSH
		35	004	24	12-25 REGEN	T	EX, R,P
				321 ACRES	REGEN HARVEST: 132 COMM. THIN : 157 SELECTIVE CUT: 32	CABLE: 21 ACRES TRACTOR: 300	LS: 114 S, HP&B: 11 HP&B: 45 EX,R: 121 EX: 30 P: 132

LOST CREEK SOUTH - FLYING LOST

TOWNSHIP	RANGE	SECTION	OI	NET ACRES	PRESCRIPTION	LOGGING SYSTEMS	SLASH TRT -SITE PREP REFORESTATION NEEDS
33S	2	11	006	5	SELECTIVE CUT	T	LS
		13	002R	6	6-8 REGEN	C	S,HP&B,P
		13	002	7	6-8 REGEN	C	S,HP&B,P
		13	002D	29	16-25 REGEN	T	EX,R,P
		13	002 A,B,C	66	SELECTIVE CUT	C(54)& T(12)	LS
		15	008	90	SELECTIVE CUT	H	LS
		21	001	38	SELECTIVE CUT	H(23),T(8)& C(7)	HP&B(23), LS(15)
		21	003	25	SELECTIVE CUT	H(20)& C(5)	LS
		21	003R	28	6-8 REGEN	H(9)& T(19)	S,HP&B(9), EX,R(19),P
		24	001	35	COMMERCIAL THIN	H	LS
		24	002	10	COMMERCIAL THIN	H	HP&B
		27	003	11	COMMERCIAL THIN	T	LS
		27	004	19	COMMERCIAL THIN	T	LS
		27	005R	21	6-8 REGEN	C(11) & T(10)	S,HP&B(11),EX,R(10),P
		27	005	22	SELECTIVE CUT	T	LS
				412 ACRES	SELECTIVE CUT: 246 REGEN HARVEST: 91 COMM. THIN : 75	CABLE: 90 ACRES TRACTOR: 117 HELICOPTER:205	LS: 288 S, HP&B: 33 HP&B: 33 EX,R: 58 P: 91

<p><u>TOTAL ACRES: 1341</u></p> <p>SELECTIVE CUT: 639 ACRES</p> <p>REGENERATION HARVEST: 277 ACRES</p> <p>COMMERCIAL THIN: 425 ACRES</p>	<p><u>LOGGING SYSTEMS:</u></p> <p>T = TRACTOR: 822 ACRES</p> <p>C = CABLE: 314 ACRES</p> <p>H = HELICOPTER: 205 AC.</p> <p>BL = BULL LINE FROM ROAD</p>	<p><u>SLASH TREATMENT & SITE PREPARATION:</u></p> <p>HP&B = HANDPILE AND BURN: 102 ACRES</p> <p>S, HP&B = SLASH BRUSH & HARDWOODS & HANDPILE & BURN: 58 ACRES</p> <p>UB = UNDERBURN: 21 ACRES</p> <p>LS = LOP AND SCATTER: 814 ACRES</p> <p>EX = EXCAVATOR PILE & BURN: 137 ACRES</p> <p>EX,R = EXCAVATOR PILE,BURN & RIP SKIDTRAILS: 209 ACRES</p> <p>P = PLANTING: 401 ACRES</p>
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LOST CREEK SOUTH MARKING GUIDELINES

Summary of treatment objectives

1. To favor a return to the seral phase of the white fir plant series as a long term silvicultural approach to provide for sustainable forest conditions. Favored species should be the shade intolerant and intermediates, ponderosa pine, sugar pine, incense cedar, Douglas-fir and hardwood species. Of particular concern is maintaining pine species on sites <3500'.
2. Maintain at least 60% canopy closure in all thinned and selectively cut stands. This level of canopy closure will minimize canopy openings, the growth of understory brush, maintain connectivity and provide a variety of plant and animal habitat across the landscape.
3. In merchantable second growth stands, to thin from below to redistribute growth to vigorous dominant and co-dominant trees.
4. To reduce density levels towards the carrying capacity of the site. In selectively cut stands, remove individual trees across all diameter classes to reduce inter-tree competition while maintaining or promoting the development of multiple canopy layers.
5. To regenerate deteriorating stands and stands with Douglas-fir infected with dwarf mistletoe; and to prepare units for seedling establishment and growth by providing suitable site conditions for planting.
6. To maintain coarse woody debris, snags and large green conifers for long term site productivity and biological legacies.
7. To return areas of diminished conifer productivity to their full, long term capability.

SELECTIVE CUT (SC)

1. 60% canopy closure, the removal of poor vigor trees and density reduction are the primary objectives for these stands.

* Dependant upon the spatial arrangement of poor vigor trees, some areas may have canopy closure greater than 60%, and in other areas less than 60%. Variability is okay, the objective is a stand average of 60% (refer to the attached canopy closure guide).

* Tree selection criteria should be based upon the retention of the desired basal area with tree vigor (risk factors) used as the primary aid in determining individual trees to mark. Refer to the attached poor vigor and high risk of mortality guidelines. Ideally, trees selected for removal should be proportional to their presence within the stand, although this will not always be possible. For example, if the size class distribution within a stand is, 70% of the trees are 8- 20" dbh, 20% of the trees are 20-32" dbh and 10% of the trees are 32" dbh or greater, then the majority of the trees selected would be in the 8-20" size class with lesser amounts marked in the 20-32" size class and even fewer marked that are greater than 32" dbh.

* The average residual basal area of treated stands will range between 140 to 220 square feet per acre. See below for the approximate residual basal area for each

stand.

* Clumpiness of residual trees is okay, meeting the target basal area is more important than meeting a spacing requirement. Spatial and structural variability is a desired stand condition.

* Trees will be marked across all diameter classes up to but not including 50" dbh.

Trees in excess of 50" dbh may **only** be removed if they are heavily infected with mistletoe (mistletoe rating >4) **and** threaten the health of the surrounding stand.

Leave mistletoe infected trees > 50" dbh that are located in topographic positions that are not conducive to the spread of the disease. Such as, draws, lower slopes of units and in areas that all adjacent trees are non-host species. These trees will provide for habitat diversity. Exception: Unit 23-008C, trees larger than 50" dbh may be marked if exhibiting deteriorating crown and tree conditions.

2. Favor drought and fire tolerant tree species, such as ponderosa pine, sugar pine, incense cedar, Douglas-fir and hardwood species. Western hemlock is a minor stand component and should remain where density levels allow. Western hemlock will provide added species diversity and is moderately tolerant of laminated root rot. Laminated root rot occurs occasionally within the sale area. In general, white fir should be discriminated against because of its low tolerance of fire, drought, and root diseases. This does not mean all white fir are to be removed. White fir should be left where necessary to meet density levels and when it is a more vigorous tree than adjacent preferred species..

3. When available release around vigorous dominant or co-dominant ponderosa pine and sugar pine. All trees, regardless of size class or vigor, underneath the dripline of released pines should be removed. Additionally, all trees up to 20" dbh within 15' of the dripline should be removed. Pine species selected for release should have full crowns with dark green foliage and minimal weak spots. Pine species with poor crowns characterized by a ragged appearance as well as foliage which is bunchy and of poor color should be removed, **do not release around**.

4. Leave all hardwoods, for species diversity, canopy layers and root disease resistance.

5. Leave all snags, stages 1-5, except those that are a safety hazard.

6. Leave all coarse woody debris, decay classes 1-5.

7. Minimize the marking of large, >20" dbh, broken, fork top and deformed trees. Retain for plant and animal habitat, as well as future sources of coarse woody debris and snags.

Unit: 11-006, 5 acres, Average BA 180 sq.ft.- Risk mark poor vigor overstory, above and below the road.

Unit: 13-002A, 15 acres, Average BA 200 sq. ft. - DF crown vigor variable with many generally good. Mark risk while maintaining canopy layers.

Unit: 13-002B, 24 acres, Average BA 200 sq. ft. - Maintain structural diversity. Do not thin second growth clumps dominated by white fir. Do thin clumps dominated by Douglas-fir. Many overstory DF are declining, particularly on the lower 1/3 slope of the unit. Remove the poorest that are most likely to die within the next five years.

Unit: 13-002C, 27 acres, Average BA 200 sq. ft. - Douglas-fir overstory with understory of 12-16" white fir in areas. Varying stand conditions. Approximately 1/3 down the ridgeline is more of a thinning type. Retain trees on top of rock outcrops.

Unit: 15-008, 90 acres, Average BA 180 sq. ft. - Very steep slopes with occasional rock outcrops. Retain trees directly on top of rock outcrops, regardless of condition.

Unit: 21-001, 38 acres, Average BA 160 sq. ft. - White fir declining, risk mark overstory, maintain desired basal area.

Unit: 21-003, 25 acres, Average BA 140 sq. ft. - Areas of blowdown salvaged under the Ground

Round Salvage. Large overstory Douglas-fir with Fomes Pini common and some patches of DF mistletoe. South of the A road smaller 10-14" dbh madrone is intermixed with scattered large DF. Risk mark overstory, maintain desired basal area.

Unit: 23-008C, 32 acres - Two storied stand with scattered poor vigor trees in the overstory and a vigorous second growth understory dominated by white fir. Risk mark the overstory, leaving the best overstory trees for structural and biological diversity (trees greater than 50" dbh may be marked if exhibiting deteriorating conditions). When tree conditions allow, leave large trees in the center of second growth clumps to minimize logging damage. Maintenance of canopy closure is important due to adjacent openings. Retain the second growth understory to provide for desired canopy closure and basal area. Thinning opportunities are limited to clumps containing mixed species. If the clump is nearly all white fir do **not** thin through.

Unit: 27-005, 22 acres, Average BA 160 sq. ft. - Southwestern boundary is the break for the deferred watershed. Overstory condition is variable, with second growth WF common. Risk mark overstory, reduce stand density & maintain target basal area.

Unit: 18-002, 42 acres, Average BA 200 sq. ft. - Combination of risk marking and basal area retention.

Unit: 19-001, 89 acres, Average BA 200 -220 sq. ft.

Unit: 19-001A, 24 acres, Average BA 200 sq.ft. - DF vigorous, WF is variable with most healthy. Vine maple in small openings. Unit is along the main ridgeline, potential windthrow is of concern. Leave all vigorous Douglas-fir regardless of spacing.

Unit: 19-001B, 27 acres, Average BA 220 sq. ft.

Unit: 19-001C, 23 acres, Average BA 220 sq. ft.

Unit: 19-001D, 39 acres, Average BA 200 sq. ft.

Unit: 19-002A, 13 acres, Average BA 180 sq. ft.

Unit: 19-002B, 18 acres, Average BA 200 sq. ft.

Unit: 19-002C, 68 acres, Average BA 180 sq. ft. - Overstory is large DF generally of good vigor, occasional DF with Fomes Pini. Minimal reprod in most areas. Vine maple 10-15' in height common. Vigorous white fir becomes dominant near ridgeline along the north/south section line and also along the southern end of this OI. In these areas favor DF when available. DF mistletoe occurs in a small pocket of trees north of the 19.01 road and east of the N/S section line.

Unit: 19-002D, 12 acres, Average BA 200 sq. ft. - Located on the west side of ridgeline, with openings on N, S & E sides. Leave higher basal area/densities along these edges for at least 2 chains into the unit. Windthrow potential is of concern. WF snag patch of 15-20 trees on the highest point within this unit. Douglas-fir and white fir condition is variable. Leave all except the highest risk trees.

Unit: 30-001A, 36 acres, Average BA 220 sq. ft. - WF & DF generally vigorous, with most risk in WF. On the west side of the riparian buffer is a laminated root rot pocket, most of the trees visibly declining are white fir, with the opening occupied by vine maple. DF mistletoe occurrence is limited to 4 DF adjacent to the B road.

Unit: 30-001B, 54 acres, Average BA 220 sq. ft. - DF mistletoe, Fomes Pini and Indian Paint fungus occasionally occurs within the unit. DF generally of good vigor.

Unit: 30-012, 5 acres, Average BA 140

sq. ft. - DF mistletoe in scattered DF. Adjacent to the N/S line numerous high risk.

COMMERCIAL THINNING (CT)

UNITS: 15-007, 10 acres (RD40), 23-006, 24 acres (RD45), 23-008, 13 acres (RD40), 24-001, 35 acres (RD35), 24-002, 58 acres (RD35), 24-003, 21 acres (RD45), 25-004, 62 acres (RD40), 26-004, 30 acres (RD40), 27-003, 11 acres (RD35), 27-004, 19 acres (RD35), 29-003, 61 acres (RD40), 29-007, 56 acres (RD40), 31-012, 21 acres (RD40).

1. Density reduction and the retention of at least 60% canopy closure are the primary objectives for these stands. Thin from below in second growth stands/clumps.
 - * Stocking will be reduced to Relative Densities of 35-45%, see above for target levels.
 - * Leave trees need to be dominant and codominant with the best crown ratios.
 - * Favor healthy ponderosa pine, sugar pine, Douglas-fir, incense cedar over western hemlock and white fir.
 - * Trees to be removed are in excess of wildlife, CWD and biological diversity needs.
2. Leave all large fire remnant trees >50" dbh, regardless of condition. **Exception:** Stand 23-006 leave all trees 48" dbh and greater.
3. Leave all hardwoods
4. Leave all snags (stages 1-5)

SHELTERWOOD RETENTION - REGENERATION HARVEST (RH)

UNIT: 35-004, 24 Acres, (approximate acres, layout and traversing may result in minor changes).

The minimum requirements in this unit are:

1. 1.8 wildlife trees/acre, >20" dbh. Approximately, 1.2 snags/acre are currently present.
2. 120 linear feet of ROD CWD. Approximately, 137 LFT/acre of CWD is on site.
3. 12-25 green conifers/acre, >20" dbh. Leave trees should have the following attributes:
 - a). windfirm (dominant/co-dominant)
 - b). disease free, specifically, mistletoe free Douglas-fir.
 - c). Crown ratio >30%, with a healthy crown, dark foliage, dense needles.
 - d). Favor healthy seral species, ponderosa pine, sugar pine, incense cedar, where possible. Tree diameter should not be the deciding factor for removing a tree, crown vigor should.
4. The target canopy closure should be 30% or greater. Depending on stand conditions some areas may have greater canopy closure and others less.

Reference: 12 TPA >20" dbh = approximately 20% canopy closure.
18 TPA >20" dbh = approximately 30% canopy closure.
25 TPA >20" dbh = approximately 38% canopy closure.

Trees less than 20" dbh will also provide some of the target canopy closure.
5. Target residual basal area approximately 100 square feet. Stand conditions will result in variable levels of basal area across the stand.
6. All healthy ponderosa pine, Douglas-fir, incense cedar, sugar pine and hardwoods regardless of size should be left (<1"-20"dbh). These trees should have the following attributes: a). crown ratios 30% b). healthy foliage c). disease and insect free.

Small diameter white fir 8-20" should be left if needed to meet canopy closure targets.
7. Retain all large hardwoods.

MODIFIED EVEN-AGED - REGENERATION HARVEST (RH)

UNITS: T33S R2E 13-002, 13-002R, 21-003R, 23-008A, 23-008B, 23-008D, 26-004R, 27-005R

T33S R3E 18-002R, 19-001R, 19-002R, 30-003

The **minimum** requirements are:

1. 1.8 wildlife trees/acre. See the table below for the existing number of snags/acre.
2. 120 linear feet of CWD. See the table below for the existing level of CWD.
3. 6-8 green conifers/acre, >20" dbh (proportionally representing the total range of tree sizes >20"). These are minimum levels, where additional healthy green trees are available they should be left. Determination of leave and take trees should be based upon tree/crown vigor as opposed to the strict implementation of the 6-8 leave tree guideline. Let tree condition dictate where and how many trees are left. Leave trees should have the following attributes: a). Windfirm b). Crown ratio >35% with a healthy crown, dark foliage, dense needles c). Disease free (specifically mistletoe free Douglas-fir) d). Favor healthy seral species, ponderosa pine, sugar pine, incense cedar, where possible.
4. All healthy ponderosa pine, Douglas-fir, incense cedar, sugar pine and hardwoods regardless of size should be left (<1"-20"dbh). These trees should have the following attributes: a). crown ratios 30% b). healthy foliage c). disease and insect free.
5. Retain all large hardwoods.
6. Units do not have to be uniform in appearance; diversity, patchiness is desirable.

EXISTING CONDITIONS

UNIT	ACRES	SNAGS/ACRE > 16"DBH DECAY CLASS1&2	CWD/LFT/ACRE DECAY CLASS 1&2, >16" 16'
13-002	7*	2.2	0
13-002R	6*	.5	171
21-003R	28*	2.8	418
23-008A	27*	.84	133
23-008B	6*	-	136
23-008D	37*	1.0	93
26-004R	5*	-	-
27-005R	21*	3.6	114
18-002R	2	3.5	171
19-001R	18	1.4	257
19-002R	17	2.6	128
30-003	17	3.5	479

* approximate acres, layout and traversing may result in minor changes.

CONNECTIVITY MODIFIED EVEN-AGED - REGENERATION HARVEST (RH)

UNITS: 15-008A & 15-008B

The **minimum** requirements are:

1. 1.8 wildlife trees/acre. See the table below for the existing number of snags/acre.
2. 120 linear feet of CWD. See the table below for the existing level of CWD.
2. 12-18 green conifers/acre, >20" dbh (proportionally representing the total range of tree sizes >20"). These are minimum levels, where additional healthy green trees are available they should be left. Determination of leave and take trees should be based upon tree/crown vigor as opposed to the strict implementation of the 12-18 leave tree guideline. Let tree condition dictate where and how many trees are left. Leave trees should have the following attributes: a). Windfirm b). Crown ratio >35% with a healthy crown, dark foliage, dense needles c). Disease free (specifically mistletoe free Douglas-fir) d). Favor healthy seral species, ponderosa pine, sugar pine, incense cedar, where possible.
3. All healthy ponderosa pine, Douglas-fir, incense cedar, sugar pine and hardwoods regardless of size should be left (<1"-20"dbh). These trees should have the following attributes: a). crown ratios 30% b). healthy foliage c). disease and insect free.
4. Retain all large hardwoods.
5. Tree diameter should not be the deciding factor for marking a tree, crown vigor should.
6. Units do not have to be uniform in appearance; diversity, patchiness is desirable.

EXISTING CONDITIONS

UNIT	ACRES	SNAGS/ACRE > 16"DBH, 1&2	CWD/LFT/ACRE DC 1&2 >16" 16'
15-008B	23*	1.8	274
15-008A	10*	5.1	0

* approximate acres, layout and traversing may result in minor changes.

STRUCTURAL RETENTION - REGENERATION HARVEST (RH)

UNITS: 13-002D

The **minimum** requirements are:

1. 1.8 wildlife trees/acre. See the table below for the existing number of snags/acre.
2. 120 linear feet of CWD. See the table below for the existing level of CWD.
2. 16-25 green conifers/acre, >20" dbh (proportionally representing the total range of tree sizes >20"). These are minimum levels, where additional healthy green trees are available they should be left. Determination of leave and take trees should be based upon tree/crown vigor as opposed to the strict implementation of the 16-25 leave tree guideline. Let tree condition dictate where and how many trees are left. Leave trees should have the following attributes: a). Windfirm b). Crown ratio >35% with a healthy crown, dark foliage, dense needles c). Disease free (specifically mistletoe free Douglas-fir) d). Favor healthy seral species, ponderosa pine, sugar pine, incense cedar, where possible.
3. All healthy ponderosa pine, Douglas-fir, incense cedar, sugar pine and hardwoods regardless of size should be left (<1"-20"dbh). These trees should have the following attributes: a). crown ratios 30% b). healthy foliage c). disease and insect free.
4. Retain all large hardwoods.
5. Tree diameter should not be the deciding factor for marking a tree, crown vigor should.
6. Units do not have to be uniform in appearance; diversity, patchiness is desirable.

EXISTING CONDITIONS

UNIT	ACRES	SNAGS/ACRE > 16"DBH, 1&2	CWD/LFT/ACRE DC 1&2 >16" 16'
13-002D	29*	4.4	57

* approximate acres, layout and traversing may result in minor changes.

RELATIVE DENSITY GUIDELINES

Use RD 35-45 when thinning in stands dominated by Douglas-fir.

Estimate the average diameter of potential leave trees and determine the desired spacing in feet by referring to the table below. Follow the basal area and spacing table as closely as possible. Once the area has been marked verify the leave basal area using a relaskop or prism, adjust basal area as necessary. As the average diameter changes spacing will also change holding stand density constant.

RELATIVE DENSITY - 35%		
AVERAGE LEAVE TREE DBH	LEAVE TREE BASAL AREA	AVERAGE LEAVE TREE SPACING
8"	99	12' X 12'
10"	111	15' X 15'
12"	121	17' X 17'
14"	131	19' X 19'
16"	140	21' X 21'
18"	148	23' X 23'
20"	157	25' X 25'
22"	164	26' X 26'
24"	171	28' X 28'
26"	178	30' X 30'
28"	185	32' X 32'
30"	191	33' X 33'

RELATIVE DENSITY - 40%		
AVERAGE LEAVE TREE DBH	LEAVE TREE BASAL AREA	AVERAGE LEAVE TREE SPACING
8"	113	12' X 12'
10"	126	14' X 14'
12"	139	16' X 16'
14"	150	18' X 18'
16"	160	20' X 20'
18"	170	21' X 21'
20"	179	23' X 23'
22"	188	25' X 25'
24"	196	26' X 26'
26"	204	28' X 28'
28"	212	30' X 30'
30"	219	31' X 31'

RELATIVE DENSITY - 45%		
AVERAGE LEAVE TREE DBH	LEAVE TREE BASAL AREA	AVERAGE LEAVE TREE SPACING
8"	127	11' X 11'
10"	142	13' X 13'
12"	156	15' X 15'
14"	168	17' X 17'
16"	180	18' X 18'
18"	191	20' X 20'
20"	201	22' X 22'
22"	211	23' X 23'
24"	220	25' X 25'
26"	229	26' X 26'
28"	238	28' X 28'
30"	246	29' X 29'

Definition: Poor Vigor - High Risk of Mortality

Trees available for removal as poor vigor - high risk include:

1. Poor vigor trees

a. Poor vigor, high risk ponderosa pine trees are defined as those trees meeting the criteria for risk classes #3 and #4, see attached guide.

b. High risk Douglas-fir and white fir trees are defined as:

* Crown has thin appearance when viewed against the sky.

* Short needle length

* Needle color very poor, yellowish.

* Dead or dying twigs or branches in the crown forming holes, sparse and ragged crown appearance.

* Poor crown ratio.

* Mistletoe infected.

c. Trees affected by root rot, visual characteristics are:

* groups of trees affected, with trees showing variable levels of decline.

* trees have reduced height growth, look at top of trees for reduced increment growth.

* yellow foliage, decline of the crown is from the top to the bottom.

* distress cone crop.

* bark beetles sometimes present because of the stressed trees.

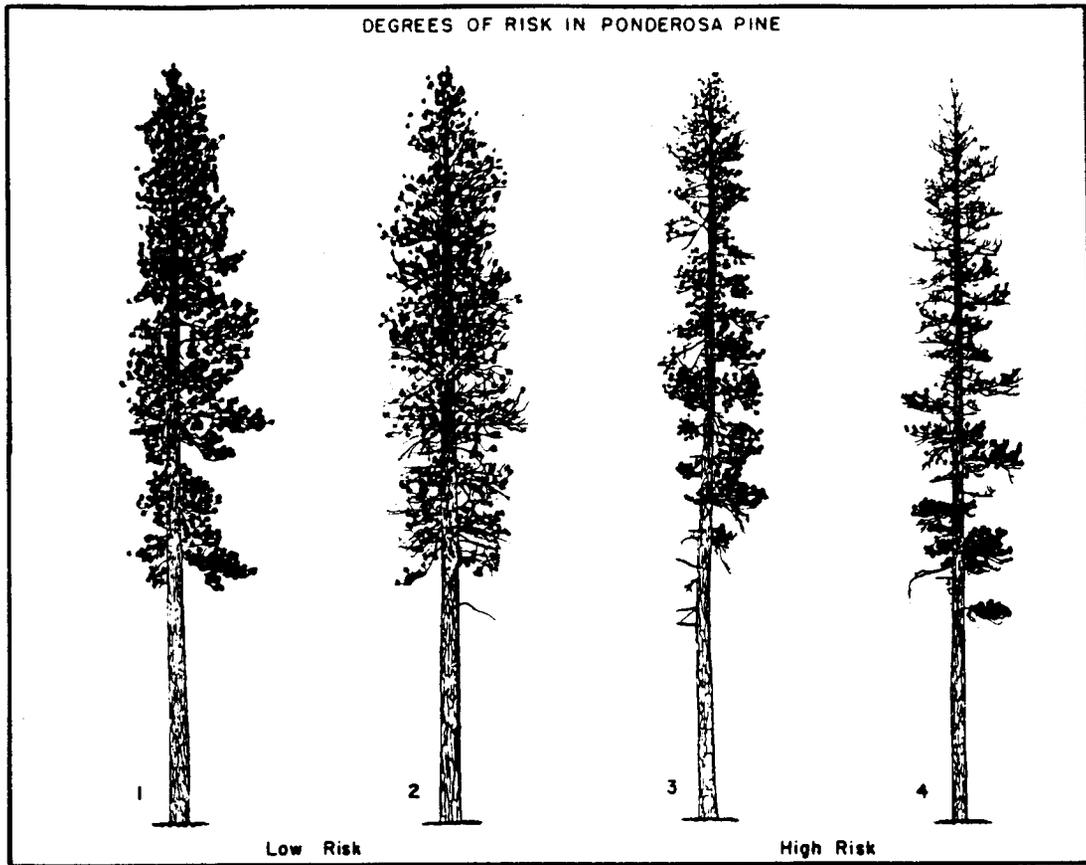
2. Insect infested trees

Douglas-fir and white fir trees undergoing attack from Douglas-fir bark beetle, as identified by red boring dust present in bark crevices or on the ground near the base of the tree. Foliage is thinning and yellowish in appearance. Borers typically begin their attack in the top of the tree, then may spread to the lower bole. Pitch streamers may also be present on the mid to upper bole.

Ponderosa pine trees undergoing current attack from western pine beetle or red turpentine beetle. Pitch tubes should contain reddish/brown granular frass. Pitch tubes clear in color indicate the tree has been successful in expelling the beetle, these trees should not be marked if otherwise healthy.

All snags and coarse woody debris will be maintained as they presently occur; snags that are a safety hazard may be felled but will be left on site.

DEGREES OF RISK IN PONDEROSA PINE



#1 - LOW RISK

- * Full foliage, healthy appearing crowns.
- * Foliage of healthy appearance; needles are long, coarse and dark green.
- * Practically all twigs with normal foliage compliment.
- * No weaken parts of crown.

#2 - MODERATE RISK

- * Fair to moderately healthy crowns, imperfect in spots.
- * Foliage mostly healthy, needle length average or better, color fair to good.
- * Some twigs or branches may lack foliage, but should not be localized to form definite "weak" spots in crowns.

#3 - HIGH RISK

- * Crowns of fair to poor health, somewhat ragged or thin in parts of crown.
- * Foliage in parts of crown thin, bunchy, or unhealthy, needles average to shorter than average in length.
- * Needle color poor to fair.
- * Some to many twigs or branches lacking foliage, few to many twigs or branches fading or dead.
- * Small localized weaken parts of crowns usually present.
- * Crown width is narrow or flat on one or more sides.

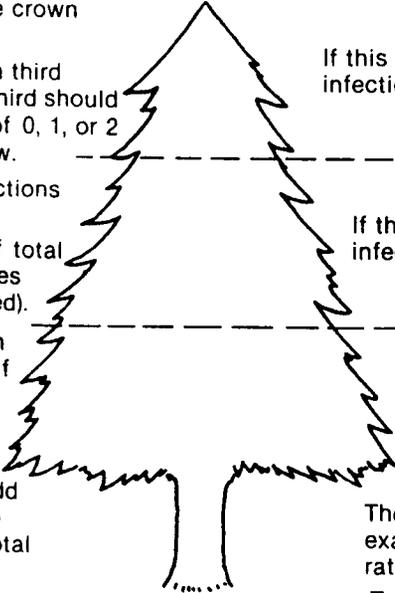
#4 - VERY HIGH RISK

- * Crowns in poor condition, ragged or thin.
- * Foliage thin or bunchy, needles short or sparse, poor color.
- * Twigs and branches dead or dying, parts of crown definitely weakened.
- * Crown width is very narrow and sparse or limbs all on one side.

The 6-Class Dwarf Mistletoe Rating System

Frank G. Hawksworth

Instructions	Example
Step 1—Divide live crown into thirds.	If this third has no visible infections, its rating is 0.
Step 2—Rate each third separately. Each third should be given a rating of 0, 1, or 2 as described below.	If this third is lightly infected, its rating is 1.
0—No visible infections	If this third is heavily infected, its rating is 2.
1—Light infection (one-half or less of total number of branches in the third infected).	The tree in this example will receive a rating of $0 + 1 + 2 = 3$.
2—Heavy infection (more than one-half of total number of branches in the third infected).	
Step 3—Finally, add ratings of thirds to obtain rating for total tree.	



Leave Tree Prescriptions and Spacing for Various Canopy Closures

Crown Radius	Trees Per Acre				Spacing Between Boles			
	40%	50%	60%	70%	40%	50%	60%	70%
3 ft.	622	771	925	1,079	8	8	7	6
4 ft.	347	434	520	607	11	10	9	8
5 ft.	222	277	333	388	14	13	11	11
6 ft.	154	193	231	270	17	15	14	13
7 ft.	113	142	170	198	20	18	16	15
8 ft.	87	108	130	152	22	20	18	17
9 ft.	68	86	103	121	25	22	21	19
10 ft.	55	69	82	97	28	25	23	21
11 ft.	46	57	69	80	31	28	25	23
12 ft.	39	48	58	67	34	30	27	25
13 ft.	33	41	49	57	36	33	30	28
14 ft.	28	35	42	50	39	35	32	30
15 ft.	25	31	37	43	42	37	34	32
16 ft.	21	27	33	38	45	40	36	34
17 ft.	19	24	29	34	48	43	39	36
18 ft.	17	21	26	30	50	46	41	38
19 ft.	15	19	23	27	53	48	44	40
20 ft.	14	17	21	24	56	51	46	43
21 ft.	13	16	19	22	59	52	48	44
22 ft.	11	14	17	20	62	56	51	47
23 ft.	10	13	16	18	64	58	52	49
24 ft.	10	12	14	17	67	60	56	51
25 ft.	9	11	13	15	70	63	58	54



Log Class 1



Log Class 2



Log Class 3

Snag Characteristics	Snag Decomposition Class				
	1	2	3	4	5 1/
Limbs and branches	All present	Few limbs, no fine branches	Limbs stubs only	Few or no stubs	None
Top	Pointed	Broken			
Diameter, broken top	Increasing at decreasing rate				
Height	Decreasing at decreasing rate				
Bark remaining %	100		Variable		20
Sapwood presence	Intact		Sloughing		Gone
Sapwood condition	Sound, incipient decay, hard, original color	Advanced decay, fibrous, firm to soft, light brown	Fibrous, soft, light to reddish brown	Cubical, soft, reddish to dark brown	
Heartwood condition	Sound, hard, original color	Sound at base, incipient decay in outer edge of upper bole, hard, light to reddish brown	Incipient decay at base, advanced decay throughout upper bole, fibrous, hard to firm, reddish brown	Advanced decay at base, sloughing from upper bole, fibrous to cubical, soft, dark reddish brown	Sloughing, cubical, soft, dark brown; or, fibrous, very soft, dark reddish brown, encased in hardened shell
Estimated age at which snags reach a deterioration state:					
3.6-7.2 in. DBH 2/	0-4	5-8	9-16	17	Fallen
7.6-18.8 in. DBH 3/	0-5	6-13	14-29	30-60	> 60
> 18.8 in. DBH 4/	0-6	7-18	19-50	51-125	> 125

1/ Mostly remnant snags.
 2/ Characteristic in Douglas-fir forests 80 years old; mean DBH 5.4 ± 1.2 in.
 3/ Characteristic in Douglas-fir forests 80-200 years old; mean DBH 12.8 ± 2.8 in.
 4/ Characteristic in Douglas-fir forests 200 years old; mean DBH 38.8 ± 16.4 in.

Sources: Brown, E. R., tech. ad. 1985. Management of wildlife and fish habitats in forests in western Oregon and Washington, Part 1 - Chapter Narratives. Publ. RG-F and WL-197-1985. Portland, OR: U.S. Department of Agriculture Forest Service, Pacific Northwest Region. 136.

COARSE WOODY DEBRIS	
TREE DBH	NUMBER OF PIECES PER TREE 16" x 16"
16"	1
20"	1
22"	2
24"	3
26"	4
28"	4
30"	5
32"	5
34"	6
36"	6
38"	6
40"	6
42"-50"	7
52"-58"	8
60"	9



Log Class 4



Log Class 5

Appendix G

TO: LOST CR. T.S. E.A. LEAD
FROM: DOUGLAS KENDIG RIPARIAN AND SENSITIVE PLANT SPECIALIST
DATE: APRIL 23, 1998
SUBJECT: LOST CREEK E.A.
SPECIAL STATUS PLANTS
RIPARIAN ISSUES

Current Condition

Riparian Vegetation

The Riparian Reserves within the project area of Lost Creek T.S. consists of a mosaic of forested and deforested zones. Riparian vegetation typical of forested areas consist of Douglas-fir and white fir in the overstory. Western hemlock is a common conifer species in the understory riparian zone and frequently provides a second canopy layer which helps maintain a cool, moist and shady environment. Vine maple, ninebark, oceanspray, dogwood, yew, Saskatoon serviceberry and a variety of ferns, mosses, lichens and liverworts are common understory and ground-level vegetation. Approximately 60% of Riparian Reserve lands are older than 80 years within the Lost Creek T.S. Where the forest canopy has been removed as a result of timber harvesting or road construction, riparian vegetation generally consists of red alder, cottonwood, Oregon ash, bigleaf maple, willow species, vine maple, Douglas spirea, Saskatoon serviceberry, mock orange, ninebark, oceanspray, and dogwood. Approximately 24% of Riparian Reserve lands are less than 20 years old within the Lost Creek T.S.

Structural characteristics of the Riparian Reserves forest stands, such as canopy closure, canopy layers, coarse woody debris, biomass accretion, nutrient cycling, and vascular and non-vascular plant species associated with old-growth are generally in good condition and are expected to be maintained over the long term. Generally, 2 to 3 canopy layers provide adequate shade on most reaches, preventing direct solar radiation and reradiation. Coarse woody debris inputs to the aquatic and riparian ecosystems are adequate on most reaches.

Riparian surveys were completed on approximately 75.1 miles of tributaries in Lost Creek watershed and assessed the functioning condition of all streams within the project area. A total of 123 miles of streams (389 reaches) were field verified as perennial, intermittent, ephemeral streams, and dry draws. Riparian survey data can be found in the Lost Creek Watershed Analysis.

Two debris flows occurred on high gradient streambanks in T33S. R2E. SEC. 13 and 14 as a result of the Jan. 1 1997 storm. All unstable areas, springs and seeps have been identified, assessed and included within Riparian Reserve boundaries (T33. R2E. SEC 11, 13, 24 and T33. R3E. SEC 19).

No Riparian Reserves have been identified which would benefit by actively managing the forest

stands.

By maintaining a one site-tree Riparian Reserve buffer and no proposed density management within the Riparian Reserve, the following ACS objectives would be met: 1, 2, 4, 5, 6, 7, 8, 9.

MANAGEMENT ACTIONS COMMON TO ALL ACTION ALTERNATIVES (Project Design Features--PDF)

1. No timber harvesting or density management would occur within Riparian Reserve lands
2. No new roads or skid roads would be constructed within Riparian Reserve lands.
3. Roads and skid roads with the Riparian Reserves identified for decommissioning would be revegetated with a composition of conifers, hardwood, brush and grass species which would be typically found in that riparian ecosystem.

ROAD DECOMMISSIONING WITHIN THE RIPARIAN RESERVE

In meeting the goals of the Aquatic conservation Strategy, approximately 5800 feet of roads within the Riparian Reserves are proposed for decommissioning. Decommissioning activities would include ripping of the road surface and revegetating the area with grasses, brush, hardwood, and conifer species that are appropriate to the site. Decommissioning of roads within the Riparian Reserve would meet the following ACS objectives: 1, 2, 4, 5, 6, 7, 8, 9.

SHORT-TERM IMPACTS

Some short-term negative impacts may occur. Some vegetation from the site may be destroyed or damaged to allow equipment access along the roads. Some erosion and movement of sediments into nearby streams from ripping the road surface may occur until vegetation has reestablished and stabilized the area.

Positive short-term impacts include restoring drainage patterns and infiltration patterns on road surfaces that were compacted and impenetrable.

LONG-TERM IMPACTS

In addition to the positive short-term impacts, positive long-term impacts include improved biological productivity of soils on previously unproductive road surfaces as vegetation develops. Vegetation would add organic debris as amendments to the soil and nutrients to road bed surfaces. Long-term soil stability would occur as conifers and hardwoods occupy the site and mature.

To: Lost Creek EA File

Appendix H

From: Jon Raby, Fishery Biologist, Butte Falls RA

Subject: Fisheries/Aquatic Ecosystem Appendix for Lost Creek South EA

Date: 3/24/98

Fisheries/Aquatic Ecosystem Existing Environment

For a more detailed description see the Lost Creek WA.

General

The dominant waterbody feature in the proposed project area is Lost Creek Reservoir. This reservoir is created by the William L. Jess Dam which was built by the Army Corps of Engineers to provide for flood control and other social benefits in the Rogue River basin. Lost Creek reservoir has a total storage capacity of 465,000 acre-feet, is 10 miles long and covers 3,426 acres at full pool (ODFW 1994). Major streams within the proposed project area include the Middle Fork of the Rogue River, Beaver Dam Creek, Round Mountain Creek, Vine Maple Creek, Parsnip Creek and Cur Creek. Other notable streams are Lost Creek (South of the reservoir), and Red Rock Canyon.

Fish Distribution

There are a variety of resident fish which occur within the proposed project area. Historically anadromous salmonids utilized areas above the William L. Jess Dam. However upon completion of the dam this historic range was eliminated. Native fish species such as cutthroat trout, rainbow trout, sculpins and Klamath smallscale suckers are present within the proposed project area. Rainbow trout have been found in Beaver Dam Creek and are the dominant salmonid species in these reaches. Cutthroat trout are found primarily in small headwater tributaries where they are the dominant fish species. This represents approximately 36.0 miles of resident trout habitat in the proposed project area. Approximately 11.5 miles is located on federally administered lands. Sculpin distribution is currently unknown. Klamath smallscale suckers have been documented only in Lost Creek Lake.

Aquatic Habitat Status

The current condition of aquatic habitat throughout fish-bearing stream reaches on all lands within the proposed project area is currently unknown. However, stream surveys limited to only stream reaches located on BLM administered land were conducted in the Lost Creek Watershed Analysis Unit (WAU) by the BLM in 1981 and 1997. Streams surveyed in 1981 and 1997 included

portions of Beaver Dam Creek, Vine Maple Creek and tributaries, Parsnip Creek, and Round Mountain Creek. In general, habitat features found to be in an impaired condition were quality and quantity of spawning habitat, amount of the riparian area in an early successional condition, and pool quality. The major identified causes for degradation of aquatic habitat were logging, roads and railroad grades, and livestock grazing. Overall, the majority of surveyed stream segments within the WAU are considered in fair to good condition. However, two of the largest streams, Beaver Dam Creek and Parsnip Creek, are in fair condition.

Aquatic Habitat Trend

It appears from the available data that the majority of aquatic habitat within the proposed project area has maintained or improved in condition on surveyed reaches over the past fifteen years. Noticeable improvement has occurred in Vine Maple Creek in the categories of pool quality and large wood abundance. Reasons for this improvement appear to be a result of improved large wood recruitment. One anomaly to the general maintenance or improvement of aquatic habitat conditions is in Parsnip Creek, where a noticeable decline in pool quality was observed. Reasons for this decline are unknown. Once again, it should be noted that surveyed reaches were limited only to BLM administered lands. Definitive conclusions about the trend in aquatic habitat on all lands throughout the proposed project area cannot be made with the available data.

IV. Environmental Consequences

No Action Alternative

Fisheries/Aquatic Resources

a) Direct and Indirect Effects

Indirectly, the vegetation within the Riparian Reserve would continue to develop and provide the long-term (50-100+ years) necessary elements for healthy aquatic ecosystems. Vegetation in non-recovered openings within the transient snow zone (TSZ) would continue to develop. This would be expected to reduce the risk of increasing the magnitude and frequency of peak flow events. Additionally, this alternative could indirectly contribute to stream sedimentation in fish-bearing stream reaches by delaying or foregoing road decommissioning, road renovation and road maintenance. This would be expected to have indirect, adverse effects for fisheries and aquatic resources through habitat degradation over the short and long-term (>5 years or until the road had fully stabilized).

b) Short-term Uses vs. Long-term Productivity

Maintaining the current Riparian Reserve vegetation throughout the proposed project area would continue to provide the long-term necessary elements for healthy aquatic ecosystems. Maintaining the current vegetation within the TSZ throughout the proposed project area would

continue to allow hydrologic recovery in these areas. This would be anticipated to help maintain or increase the current productivity of fisheries and aquatic resources over the long-term (50-100+ years).

By delaying or foregoing road decommissioning, road renovation and road maintenance in the short-term (1-5 years), a higher risk of stream sedimentation from roads is likely in the short-term. This would be anticipated to maintain or increase current levels of stream sedimentation. This would be expected to adversely affect aquatic habitat and potentially the productivity of fisheries and aquatic resources in the watershed over the long-term.

c) Irreversible or Irretrievable Commitments of Resources

None anticipated.

d) Cumulative Effects

A positive cumulative effect to fish and aquatic resources should result due to increased sizes and amounts of large wood contributed to the aquatic ecosystem as the Riparian Reserve vegetation develops and delivers material to the streams over the long-term. This alternative would also be expected to cumulatively reduce the amount of non-recovered openings within the TSZ. As a result, a cumulative reduction in altering the magnitude and frequency of peak flow events should occur.

Foregoing road decommissioning, road maintenance or renovation opportunities could lead to an increase in stream sedimentation levels from surface erosion or mass failure of cuts and fills. Foregoing these opportunities would be expected to have an adverse cumulative effect on fisheries and aquatic resources through potential cumulative increases in stream sediment levels. Some roads may stabilize over time as they revegetate. However, this may take many decades to achieve. This is also dependent upon private activities and their use and maintenance of the transportation system in the watershed.

e) **Determination of Effects on Northern California/ Southern Oregon Coho Salmon (Transboundary Coho Salmon) and Klamath Mountains Province (KMP) Steelhead Trout from Implementation of the Proposed Alternative:**

May Affect, Not Likely to Adversely Affect

The proposed timber sale is located above Lost Creek Dam on the Rogue River and no longer supports Transboundary Coho Salmon or KMP Steelhead Trout. The No Action Alternative is not likely to result in more than a negligible chance of “take¹” of Transboundary Coho Salmon or KMP Steelhead Trout.

**Effects From Implementing Action Alternative 1
Fish/Aquatic Resources**

a) **Direct and Indirect Effects**

No direct effects to fish or aquatic resources are anticipated from the proposed timber harvest. Indirectly, the vegetation within the Riparian Reserve would continue to develop and provide the long-term necessary elements for healthy aquatic ecosystems. Proposed harvest units would not reduce the forest canopy below 60% and vegetation in non-recovered openings within the TSZ would continue to develop. Overall, this would be expected to reduce the risk of increasing the magnitude and frequency of peak flow events.

The proposed road decommissioning would be expected to restore more natural hydrologic flow paths and reduce the risk of erosion and subsequent stream sedimentation from these roads. This would be expected to indirectly benefit fish within the watershed by reducing potential road generated fine sediment. Indirectly, fish and aquatic resources could be adversely affected from low level, localized increases to baseline stream turbidity and sediment levels in the short-term (<1 year). These increases would not be expected to persist beyond one year after completion of the proposed activities.

The proposed road maintenance, road renovation and temporary operator spur construction would be expected to have indirect, adverse affects to fish and aquatic habitat from localized increases to baseline stream turbidity and sediment levels in the short-term (<1 year). These increases would not be expected to persist beyond one year after completion of the proposed activities. Conversely, the proposed road maintenance and road renovation actions would be

¹“Take” - The ESA (Section 3) defines take as “to harass, harm, pursue, hunt, shoot, wound, capture, collect or attempt to engage in such conduct”. The U.S. Fish and Wildlife Service further defines “harm” as “significant habitat modification or degradation that results in death or injury to a listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering” and “harass” as “actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering”. Additionally, take, as defined in the ESA clearly applies to the individual level. Thus actions that have more than a negligible potential to cause take of individual eggs and/or fish, are “likely to adversely affect” (NMFS 1995).

expected to indirectly benefit fish within the watershed by reducing the risk of sedimentation to streams from these roads in the short and long-term (>5 years).

Implementation of the appropriate PDF's is expected to minimize the anticipated indirect effects of the proposed actions to negligible levels.

b) Short-term Uses vs. Long-term Productivity

No effects to the long-term productivity of fisheries and aquatic resources are anticipated from the proposed timber harvest. Maintaining the current Riparian Reserve design and allowing this vegetation to develop throughout the proposed project area would continue to provide the long-term necessary elements for healthy aquatic ecosystems. Maintaining the current vegetation within the TSZ throughout the proposed project area would continue to allow hydrologic recovery in these areas. Maintaining 60% or greater canopy closure in proposed harvest units would not increase openings within the TSZ. Overall, this would be anticipated to help maintain or increase the current productivity of fisheries and aquatic resources over the long-term.

Short-term (1-5 years), localized increases to baseline stream sediment levels are anticipated to occur from road maintenance, renovation, and decommissioning under the proposed timber sale. However, it is anticipated that an overall reduction in the risk to increasing baseline stream sediment levels would occur due to maintenance, renovation, and decommissioning of the road system. Subsequently, it is anticipated the current productivity of fisheries and aquatic resources in the watershed would be maintained or increased over the long-term.

Implementation of the appropriate PDF's is expected to minimize short-term increases to baseline stream sediment levels to negligible amounts.

c) Irreversible or Irretrievable Commitments of Resources

None anticipated.

d) Cumulative Effects

No adverse cumulative effects to fish and aquatic resources are anticipated from the proposed timber harvest. Additionally, this alternative would allow the vegetation within the Riparian Reserve to continue to develop and contribute large wood to the aquatic ecosystem. This alternative would also be expected to cumulatively reduce the amount of non-recovered openings within the TSZ. Additionally, maintaining 60% or greater canopy closure in proposed harvest units would not increase openings within the TSZ. As a result, an overall cumulative reduction in altering the magnitude and frequency of peak flow events should occur. This is anticipated to result in a positive cumulative effect to fish and aquatic resources due to increased habitat quality and quantity.

The proposed project could have an adverse affect on fisheries and aquatic resources in localized areas by adding to current high levels of stream sediment from road maintenance, renovation, and decommissioning. Conversely, a long-term, positive, cumulative effect to fish and aquatic resources is anticipated from reducing potential road generated fine sediment throughout the proposed project area by completing road maintenance, renovation, and decommissioning.

Implementation of the appropriate PDF's is expected to reduce the anticipated adverse, cumulative effects of the proposed actions to negligible levels.

e) Determination of Effects on Northern California/ Southern Oregon Coho Salmon (Transboundary Coho Salmon) and Klamath Mountains Province (KMP) Steelhead Trout from Implementation of the Proposed Actions:

May Affect, Not Likely to Adversely Affect

The proposed timber sale is located above Lost Creek Dam on the Rogue River and no longer supports Transboundary Coho Salmon or KMP Steelhead Trout. The proposed Action Alternative is not likely to result in more than a negligible chance of "take" of Transboundary Coho Salmon or KMP Steelhead Trout.

Effects of Implementing Action Alternative 2

Fish /Aquatic Resources

a) Direct and Indirect Effects

No direct effects to fish or aquatic resources are anticipated from the proposed timber harvest. This alternative would allow the vegetation within the Riparian Reserve to continue to develop to provide the long-term elements necessary for healthy aquatic ecosystems. This proposed alternative would increase the amount of TSZ openings by 898 acres. As a result, this could increase the risk of a higher magnitude and frequency of peak flow events in stream channels. This would persist until these openings reached a hydrologic state of recovery (~10 years). This could indirectly alter or degrade fish habitat, especially in the Round Mountain Creek and Lost Creek (south) drainages. The magnitude of these effects is currently unknown, but would be expected to pose a relatively high risk in comparison with other alternatives. In non-fishbearing streams that drain into the south portion of Lost Creek Lake such as Red Rock Canyon, the effects would be similar to fish-bearing streams. This could indirectly alter or degrade habitat for aquatic and aquatic dependent species (e.g. amphibians, mollusks, aquatic insects).

The proposed road decommissioning would be expected to restore more natural hydrologic flow paths and reduce the risk of erosion and subsequent stream sedimentation from these roads. This would be expected to indirectly benefit fish within the watershed by reducing potential road generated fine sediment and reduce some of the effects from non-recovered openings in the TSZ (i.e. - increased water infiltration, reduced run-off). Indirectly, fish and aquatic resources could be

adversely affected from low level, localized increases to baseline stream turbidity and sediment levels in the short-term (<1 year). These increases would not be expected to persist beyond one year after completion of the proposed activities.

The proposed road maintenance, road renovation and operator spur construction would be expected to have indirect, adverse affects to fish and aquatic habitat from localized increases to baseline stream turbidity and sediment levels in the short-term (<1 year). These increases would not be expected to persist beyond one year after completion of the proposed activities. Conversely, the proposed road maintenance and road renovation actions would be expected to indirectly benefit fish within the watershed by reducing the risk of sedimentation to streams from these roads in the short and long-term (>5 years).

Implementation of the appropriate PDF's is expected to reduce the anticipated indirect effects of the proposed actions to moderately-low levels.

b) Short-term Uses vs. Long-term Productivity

No effects to the long-term productivity of fisheries and aquatic resources are anticipated from the proposed timber harvest. Maintaining the current Riparian Reserve design and allowing this vegetation to develop throughout the proposed project area would continue to provide the long-term necessary elements for healthy aquatic ecosystems and would be anticipated to maintain or increase the current productivity of fisheries and aquatic resources over the long-term. In drainages where an increased risk in the magnitude and frequency of peak flows would result from an increase in TSZ openings, the long-term productivity (~10 years) of aquatic habitat could be altered if a magnified peak flow event were to occur in one of these drainages.

Short-term (1 -5 years) increases to baseline stream sediment levels are anticipated to occur from road maintenance, renovation, and decommissioning under the proposed timber sale. However, it is anticipated that an overall reduction in the risk to increasing baseline stream sediment levels would occur due to maintenance, renovation, and decommissioning of the road system. Subsequently, it is anticipated the current productivity of fisheries and aquatic resources in the watershed would be maintained or increased over the long-term.

Implementation of the appropriate PDF's is expected to reduce the effects to aquatic habitat to moderately-low levels .

c) Irreversible or Irretrievable Commitments of Resources

Same as Alternative 2.

d) Cumulative Effects

No adverse cumulative effects to fish and aquatic resources are anticipated from the proposed timber harvest. Additionally, this alternative would allow the vegetation within the Riparian Reserve to continue to develop and contribute large wood to the aquatic ecosystem. This is anticipated to result in a positive cumulative effect to fish and aquatic resources due to increased habitat quality and quantity. This proposed alternative would increase the amount of TSZ openings by 898 acres which could cumulatively increase the risk of a higher magnitude and frequency of peak flow events in stream channels.

The proposed project could have an adverse affect on fisheries and aquatic resources in the short-term by adding to current high levels of stream sediment from road maintenance, renovation, and decommissioning. Conversely, a long-term, positive, cumulative effect to fish and aquatic resources is anticipated from reducing potential road generated fine sediment by completing road maintenance, renovation, and decommissioning.

Implementation of the appropriate PDF's is expected to reduce the anticipated adverse, cumulative effects of the proposed actions to moderately-low levels.

e) Determination of Effects on Northern California/ Southern Oregon Transboundary Coho Salmon and Klamath Mountains Province Steelhead Trout from Implementation of the Proposed Actions:

May Affect, Not Likely to Adversely Affect

See Fisheries Determination of Effects, Alternative 2.

Effects of Implementing Action Alternative 3

Fish /Aquatic Resources

a) Direct and Indirect Effects

No direct effects to fish or aquatic resources are anticipated from the proposed timber harvest. This alternative would allow the vegetation within the Riparian Reserve to continue to develop to provide the long-term elements necessary for healthy aquatic ecosystems. This proposed alternative would increase the amount of TSZ openings by 200 acres. As a result, this could increase the risk of a higher magnitude and frequency of peak flow events in stream channels. This would persist until these openings reached a hydrologic state of recovery (~10 years). This could indirectly alter or degrade fish habitat, especially in the Round Mountain Creek and Lost Creek (south) drainages. The magnitude of these effects is currently unknown, but would be expected to pose a relatively moderate risk in comparison with other alternatives. In non-fishbearing streams that drain into the south portion of Lost Creek Lake such as Red Rock

Canyon the effects would be similar to fish-bearing streams. This could indirectly alter or degrade aquatic and aquatic dependent species habitat (e.g. amphibians, mollusks, aquatic insects).

The proposed road decommissioning would be expected to restore more natural hydrologic flow paths and reduce the risk of erosion and subsequent stream sedimentation from these roads. This would be expected to indirectly benefit fish within the watershed by reducing potential road generated fine sediment and some effects from non-recovered openings in the TSZ. Indirectly, fish and aquatic resources could be adversely affected from low level, localized increases to baseline stream turbidity and sediment levels in the short-term (<1 year). These increases would not be expected to persist beyond one year after completion of the proposed activities

The proposed road maintenance, road renovation and operator spur construction would be expected to have indirect, adverse affects to fish and aquatic habitat from localized increases to baseline stream turbidity and sediment levels in the short-term (<1 year). These increases would not be expected to persist beyond one year after completion of the proposed activities.

Conversely, the proposed road maintenance and road renovation actions would be expected to indirectly benefit fish within the watershed by reducing the risk of sedimentation to streams from these roads in the short and long-term (>5 years).

Implementation of the appropriate PDF's is expected to reduce the anticipated indirect effects of the proposed actions to low levels.

b) Short-term Uses vs. Long-term Productivity

No effects to the long-term productivity of fisheries and aquatic resources are anticipated from the proposed timber harvest. Maintaining the current Riparian Reserve design and allowing this vegetation to develop throughout the proposed project area would continue to provide the long-term necessary elements for healthy aquatic ecosystems and would be anticipated to maintain or increase the current productivity of fisheries and aquatic resources over the long-term. In drainages where an increased risk in the magnitude and frequency of peak flows would result from an increase in TSZ openings, the long-term productivity (~10 years) of aquatic habitat could be altered if a magnified peak flow event were to occur in one of these drainages.

Short-term (1 -5 years) increases to baseline stream sediment levels are anticipated to occur from road maintenance, renovation, and decommissioning under the proposed timber sale. However, it is anticipated that an overall reduction in the risk to increasing baseline stream sediment levels would occur due to maintenance, renovation, and decommissioning of the road system.

Subsequently, it is anticipated the current productivity of fisheries and aquatic resources in the watershed would be maintained or increased over the long-term.

Implementation of the appropriate PDF's is expected to reduce the effects to aquatic habitat to low levels .

c) Irreversible or Irrecoverable Commitments of Resources

Same as Alternative 2.

d) Cumulative Effects

No adverse cumulative effects to fish and aquatic resources are anticipated from the proposed timber harvest. Additionally, this alternative would allow the vegetation within the Riparian Reserve to continue to develop and contribute large wood to the aquatic ecosystem. This is anticipated to result in a positive cumulative effect to fish and aquatic resources due to increased habitat quality and quantity. This proposed alternative would increase the amount of TSZ openings by 200 acres which could cumulatively increase the risk of a higher magnitude and frequency of peak flow events in stream channels.

The proposed project could have an adverse effect on fisheries and aquatic resources in the short-term by adding to current high levels of stream sediment from road maintenance, renovation, and decommissioning. Conversely, a long-term, positive, cumulative effect to fish and aquatic resources is anticipated from reducing potential road generated fine sediment by completing road maintenance, renovation, and decommissioning.

Implementation of the appropriate PDF's is expected to reduce the anticipated adverse, cumulative effects of the proposed actions to low levels.

**e) Determination of Effects on Northern California/ Southern Oregon
Transboundary Coho Salmon and Klamath Mountains Province Steelhead
Trout from Implementation of the Proposed Actions:**

May Affect, Not Likely to Adversely Affect

See Fisheries Determination of Effects, Alternative 2.

APPENDIX I - STAND INVENTORY SUMMARY TABLE - LOST CREEK SOUTH

DEFINITIONS:

1. T-R-S

Township-Range-Section (T-R-S), the geographic location of the area.

2. OI #

Operational inventory (OI) unit number. This is a stand of trees with similar characteristics.

3. BA SQ FT

Basal area in square feet (BA SQ FT) is a measure of crowding within a stand of trees. Basal area is the area of the cross section of a tree stem at 4.5 feet above the ground.

4. RD

Relative Density (RD) is a measure of crowding in a stand of trees. It compares the number of trees present to the number of trees that the site has resources (water, nutrients, sunlight) to support. At a relative density of 35-50%, stand vigor and growth is maximized. At relative densities greater than 60% the following conditions begin to occur:

- * Competition related mortality becomes significant.
- * Self thinning starts.
- * Decline in growth.
- * Volume growth/acre is offset by mortality.
- * Increased susceptibility to insect attack and disease infection.

5. ROD CWD LFT/AC

Linear feet per acre (LFT/AC) of decay class 1&2 coarse woody debris (CWD) that is at least 16" on the large end by 16' in length as defined in the Record of Decision (ROD C-40).

6. SNAGS/AC, STAGE 1&2, >16"

Number of dead standing stage 1&2 trees per acre greater than 16" diameter at breast height.

T-R-S	OI #	ACRES	VOLUME /ACRE BD.FT	BA SQFT	RD	ROD CWD LFT/A	SNAGS/AC STAGE 1&2 >16"
2E 1	006	5	25000	-	-	-	-
13	002A	15	83464	304	0.93	-	-
13	002B	30	89045	310	0.93	0	2.18
13	002C	27	83411	307	1.03	171	0
13	002D (002R)	29	76077	298	0.93	57	4.37
13	002	7	85326	304	0.83	171	0.53
15	007	10	10000	-	-	-	-
15	008	90	50000	-	-	-	-
15	008A	10	73429	298	0.87	274	1.75
15	008B	23	69838	337	1.24	0	5.14
21	001	38	40000	-	-	-	-
1	003 (003R)	53	55616	231	0.9	418	2.83
23	006	24	61892	298	1	68	0
23	008A	46	78805	320	1.1	133	0.84
23	008B	6	76972	278	0.88	214	0.44
23	008C	22	72542	274	0.67	-	0
23	008D	41	54888	244	0.87	93	1.01
24	001	35	68678	278	0.88	214	0.44
24	002	58	66563	274	0.67	-	0
24	003	21	59776	326	1	68	0
25	004	62	77556	272	0.46	0	0.77
26	004	35		-	-	-	-
27	003	4	41990	231	0.74	0	0
27	004	19	59208	328	1	137	2.9

T-R-S	OI #	ACRES	VOLUME /ACRE BD.FT	BA SQ FT	RD	ROD CWD LFT/AC	SNAGS/AC STAGE 1&2 >16"
	005 (005R)	43	59646	266	0.84	114	3.65
35	004	24	50936	233	0.65	137	1.19
33S-3E 18	002 (002R)	44	114066	321	1.1	171	3.47
19	001A	24	80979	297	0.7	114	6.59
19	001B (001R)	41	100000	405	1.4	257	1.41
19	001C	23	109204	368	1.0	49	3.06
19	001D	43	97654	358	1.4	98	0
19	002A (002R.002)	37	80316	249	0.98	299	3.76
19	002B	18	91227	346	0.86	0	1.79
19	002C	68	97809	285	1.0	404	0.75
19	002D	12	80810	280	0.82	128	2.59
	003	61	51022	291	0.72	68	1.34
29	007	56	67452	319	0.83	205	10.29
30	001A (001)	43	107466	345	0.99	423	4.69
30	001B	54	112567	377	1.0	205	2.94
30	003	17	92850	306	0.87	479	3.52
31	012 (012A)	26	56231	263	0.92	124	2.02

TABLE II

Lost Creek South

ROAD NUMBER				MILES	SURFACE	CONTROL	REMARKS
33 S	01 E	25		1.49	BST	BL	Renovate; Laurelhurst Road
33 S	02 E	13	A1	0.49	ASC	BL	Renovate
33 S	02 E	13.01	A	0.99	PRR	BL	Renovate
33 S	02 E	13.01	B	0.24	PRR	PV	Renovate; repair slide area.
33 S	02 E	13.02	A	0.17	ABC	PB	Renovate
33 S	02 E	13.04		0.96	ASC	BL	Renovate; install water bars and log-earth barrier after use.
33 S	02 E	14	B 1	0.06	NAT	BL	Rip, vegetate, install water bars and log-earth barrier at BLM property line and at jct. of 33-2E-15.00 road.
33 S	02 E	14	B2	0.84	PRR	BL	Renovate
33 S	02 E	14	C	0.9	NAT	PV	Renovate; surface with 6"-8" of crushed rock.
33 S	02 E	14	D	0.4	NAT	BL	Renovate; surface with 6"-8" of crushed rock.
33 S	02 E	14.01		0.94	PRR	PV	Renovate; install water bars and log-earth barrier after use.
33 S	02 E	15	A	0.95	ASC	BL	Renovate
33 S	02 E	15	B	0.06	ASC	BL	Renovate
33 S	02 E	15.01	A	0.3	PRR	PV	Renovate
33 S	02 E	21		0.27	PRR	PV	Renovate
33 S	02 E	22	C	0.91	ABC	BL	Renovate
33 S	02 E	22.02		1.43	ABC	PV	Renovate
33 S	02 E	22.03		1.52	ASC	BL	Renovate
33 S	02 E	22.04	A1	1.25	PRR	PV	Renovate
	02 E	22.04	A2	0.27	PRR	PV	Renovate
33 S	02 E	22.05		0.58	NAT	BL	Renovate; install water bars and log-earth barrier at property line after use.
33 S	02 E	22.06	A	0.05	NAT	PV	Renovate
33 S	02 E	22.06	B	0.15	NAT	PV	Renovate
33 S	02 E	22.08		0.28	PRR	PV	Renovate
33 S	02 E	23	A	0.43	ASC	BL	Renovate; close existing guard rail barrier after use.
33 S	02 E	23	B	0.46	NAT	BL	Renovate; install water bars and log-earth barrier after use.
33 S	02 E	23.01		0.26	NAT	PV	Install water bars and log-earth barrier.
33 S	02 E	24		0.28	ABC	PV	Renovate
33 S	02 E	25	A	0.68	NAT	BL	Renovate
33 S	02 E	25	B	0.35	NAT	PV	Renovate
33 S	02 E	25.02	A	0.42	ASC	BL	Renovate
33 S	02 E	25.02	B	0.17	NAT	BL	Renovate; reblock road after use.
33 S	02 E	25.03		0.19	ASC	BL	Renovate; quarry road
33 S	02 E	27	A	0.52	ABC	BL	Renovate
33 S	02 E	27	B	0.44	ABC	PV	Renovate
33 S	02 E	27.02		0.37	ABC	BL	Install water bars and log-earth barrier.
33 S	02 E	27.03		0.62	ABC	BL	Install water bars and log-earth barrier.
33 S	02 E	27.04		0.7	ABC	BL	Renovate; install water bars and log-earth barrier after use.
33 S	02 E	27.05		0.59	ABC	BL	Renovate; install water bars and log-earth barrier after use.
33 S	02 E	27.07	A	0.26	ABC	PV	Renovate
	02 E	28	B	0.37	NAT	BL	Install log-earth barrier at both ends on BLM land.

TABLE II

Lost Creek South

ROAD NUMBER				MILES	SURFACE	CONTROL	REMARKS
33 S	02 E	33	A	1.51	ASC	PB	Renovate; "B" Road
33 S	02 E	33	B	1.66	ASC	BL	Renovate; "B" Road
33 S	02 E	33	C	1.02	ASC	BL	Renovate; "B" Road
33 S	02 E	33.01	B	0.42	NAT	BL	Rip, revegetate, install water bars and log-earth barrier beyond junction of 33-2E-33.02 road
33 S	02 E	35.02	A	0.2	ASC	PB	Renovate
33 S	02 E	35.02	B	0.39	PRR	PB	Renovate
33 S	02 E	35.02	C	0.33	PRR	PV	Renovate
33 S	02 E	35.02	D	0.45	NAT	BL	Renovate
33 S	02 E	36.03		0.33	NAT	PV	Renovate
33 S	03 E	18		0.81	NAT	BL	Install water bars & log-earth barrier; rip 0.3 miles & vegetate.
33 S	03 E	19	A1	1.58	ASC	BL	Renovate; "B" Road
33 S	03 E	19	A2	0.36	ASC	BL	Renovate; "B" Road
33 S	03 E	19	B	0.5	ASC	BL	Renovate; "B" Road
33 S	03 E	19.01	A	1.02	NAT	BL	Renovate; surface with 6" of crushed rock.
33 S	03 E	19.01	B	0.62	NAT	PV	Renovate
33 S	03 E	19.01	C	0.4	NAT	PV	Lone Rock Proposed Construction; renovate
33 S	03 E	19.02		1.04	ABC	BL	Renovate
33 S	03 E	19.03	A	0.46	ABC	BL	Renovate
33 S	03 E	19.03	B	0.7	NAT	BL	Install log-earth barrier.
33 S	03 E	19.04	A	1.15	ABC	BL	Renovate
33 S	03 E	19.04	B	0.38	ASC	BL	Install water bars and log-earth barrier at BLM property line.
33 S	03 E	20	A	1.27	ASC	BL	Renovate
33 S	03 E	28	A	0.29	PRR	PV	Renovate
33 S	03 E	28	B	2.16	PRR	BL	Renovate; spot rock
33 S	03 E	28	C	0.23	PRR	PV	Renovate; spot rock
33 S	03 E	28	D	0.58	PRR	BL	Renovate; spot rock
33 S	03 E	28.01	A1	2.51	ASC	PB	Renovate
33 S	03 E	28.01	A2	0.06	ASC	PB	Renovate
33 S	03 E	28.01	B	0.59	ASC	BL	Renovate
33 S	03 E	28.01	C	0.11	ASC	BL	Renovate
33 S	03 E	29	A	0.11	NAT	BL	Renovate; possible surfacing
33 S	03 E	29	B	0.28	NAT	PV	Renovate; possible surfacing
33 S	03 E	29	C1	0.28	NAT	BL	Renovate
33 S	03 E	29	C2	0.2	NAT	BL	Renovate; install water bars and log-earth barrier after use.
33 S	03 E	29.01		0.52	NAT	BL	Renovate; rip, vegetate, install water bars and log-earth barrier after use.
33 S	03 E	29.02		0.3	NAT	BL	Renovate; realign approach; install water bars and log-earth barrier after use.
33 S	03 E	29.03		0.13	NAT	BL	Renovate; install water bars and log-earth barrier after use.
33 S	03 E	30		1.1	ABC	BL	Renovate
33 S	03 E	30.01		0.56	ABC	BL	Renovate
33 S	03 E	30.02		0.47	ABC	PV	Renovate

TABLE II

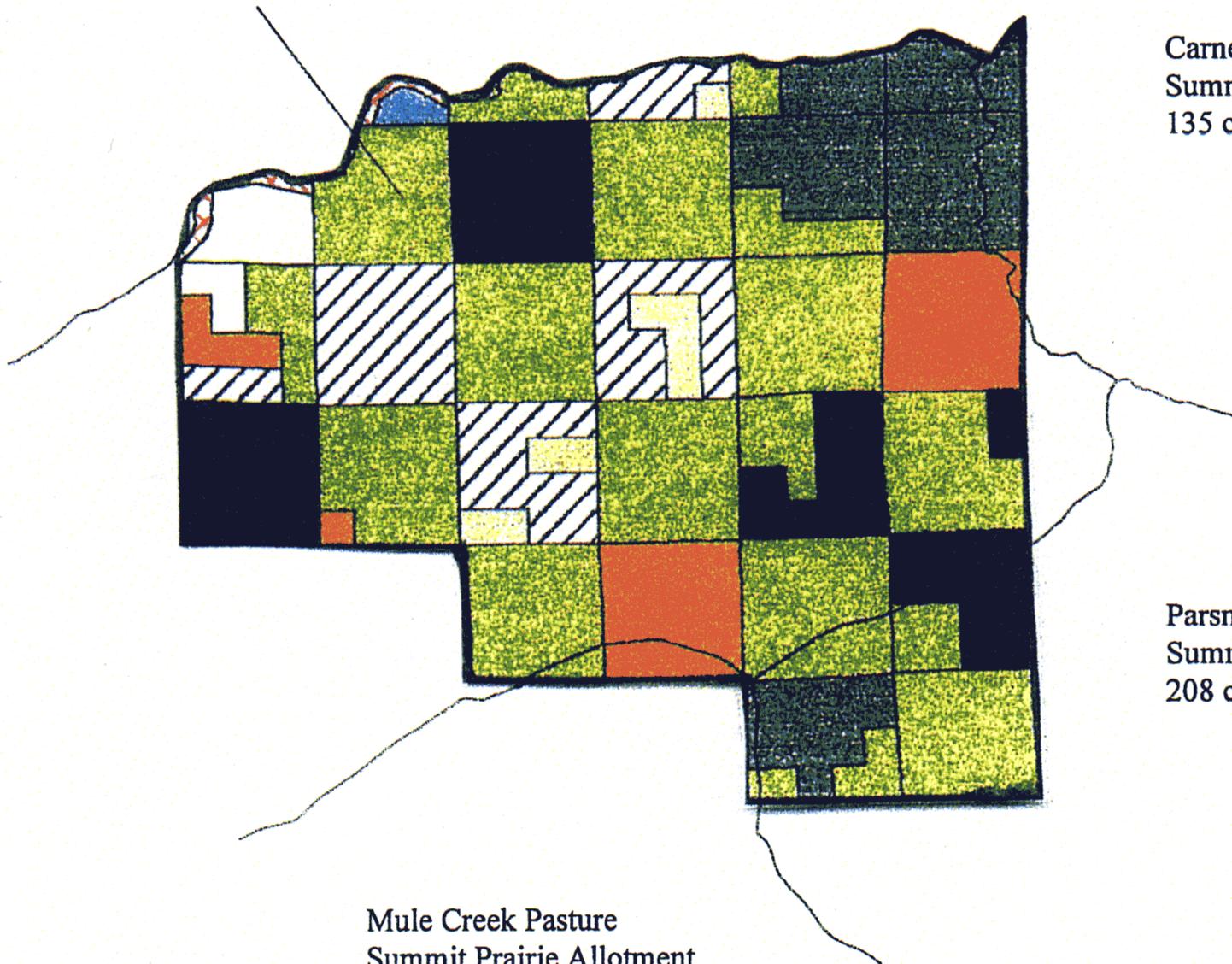
Lost Creek South

ROAD NUMBER		MILES	SURFACE	CONTROL	REMARKS
33 S	03 E 31	0.51	PRR	PV	Renovate; spot rock.
33 S	03 E 31.05	0.57	NAT	BL	Rip, vegetate, install water bars and log-earth barrier.
33 S	03 E 33.02	0.32	NAT	BL	Water bars only (no road closure).
33 S	03 E 34 A1	1.12	ASC	PB	Renovate; "A" Road
33 S	03 E 34 A2	0.7	ASC	PB	Renovate; "A" Road
33 S	03 E 34 B1	0.17	ASC	PB	Renovate; "A" Road
33 S	03 E 34 B2	1.51	ASC	PB	Renovate; "A" Road
33 S	03 E 34.01 C	0.61	ABC	PV	Install log-earth barrier at each end of this segment.
34 S	02 E 4.02 A	0.76	NAT	BL	Rip, vegetate, install water bars and log-earth barrier at both ends on BLM property.
34 S	02 E 7 A	0.65	ASC	PB	Renovate; "B" Road
34 S	02 E 8 A	0.33	BST	PV	Renovate; "A" Road
34 S	02 E 8 B2	0.2	ASC	PB	Renovate; "A" Road; surface with 6"-8"of crushed rock.
34 S	02 E 8 C1	3.71	ASC	PB	Renovate; "A" Road; surface with 6"-8"of crushed rock.
34 S	02 E 8 C2	4.18	ASC	PB	Renovate; "A" Road
34 S	02 E 8 C3	2	ASC	PB	Renovate; "A" Road
34 S	02 E 8.01 A	0.39	ASC	PB	Renovate; "B" Road
34 S	02 E 8.01 B	2.23	ASC	PB	Renovate; "B" Road
34 S	02 E 8.01 C	1.23	ASC	BL	Renovate; "B" Road
34 S	03 E 2	0.23	NAT	BL	Rip, revegetate, and install water bars and log-earth barrier.
	03 E 4.03 B	0.27	NAT	BL	Install water bars and log-earth barrier on property boundary at both ends, pull pipes, rip and vegetate.
34 S	03 E 5.02	0.29	NAT	BL	Rip, revegetate, and install water bars.
34 S	03 E 5.04	0.85	NAT	BL	Install water bars and log-earth barrier at BLM property line.
34 S	03 E 7.03	0.44	ABC	BL	Install water bars and log-earth barrier.
34 S	03 E 7.04	1.19	ABC	BL	Install gate.
34 S	03 E 9.01 B	0.52	NAT	BL	Install water bars and log-earth barrier at property boundaries.
34 S	03 E 9.02 A	1.78	NAT	BL	Reinstall log-earth barrier at the junction of 5.01 & 9.03 roads.
34 S	03 E 9.02 C	0.45	NAT	BL	Reinstall log-earth barrier at the junction of 34-3E-5.00 road.
34 S	03 E 10.01 D	0.45	NAT	BL	Install 2 armored water dips & log-earth barrier at BLM property boundary.
34 S	03 E 10.01 E	0.21	NAT	BL	Remove pipe and install log-earth barrier.

LIVESTOCK GRAZING LOST CREEK SOUTH T.S. ANALYSIS AREA

Round Mountain Pasture
Summit Prairie Allotment
184 cows 6/1 - 9/30

Carney Pasture
Summit Prairie Allotment
135 cows 6/1 - 9/30



Parsnip Creek Pasture
Summit Prairie Allotment
208 cows 6/1 - 9/30

Mule Creek Pasture
Summit Prairie Allotment
183 cows 6/1 - 9/30

- | | |
|---|--|
|  BLM O&C Land |  Lone Rock Timber Co. |
|  BLM PD Lands |  Rough & Ready |
|  Boise Cascade |  Superior Lumber Co. |
|  Silver Butte Lumber |  Rogue Resources |
|  Core of Engineers |  U. S. F. S. |
|  State Lands |  Other Lands |
|  KOGAP Lands | |

LOST CREEK WATERSHED ANALYSIS UNIT

LATE SUCCESSIONAL FOREST (STAND AGE 80 YRS) SUMMARY

TOTAL FEDERAL ACRES IN WATERSHED
 BLM 19,075
 ACCE 2,968
 USFS 254
 TOTAL 22,294

80 YR OLD & GREATER STANDS - 15% FEDERAL FOREST ANALYSIS

** NO STAND AGES AVAILABLE FOR USFS OR COE LATE SUCCESSIONAL FOREST **
 ** WAS INTERPRETED WITH 1996 AERIAL PHOTOS FOR COE LAND. ALL USFS LAND **
 ** WAS CONSIDERED FORESTED AND EARLY SUCCESSIONAL FOR THIS ANALYSIS **

FORESTED BLM ACRES = 17,624
 FORESTED USFS ACRES = 254
 FORESTED ACCE ACRES = 1,876
 TOTAL = 19,754
 15% OF FORESTED LAND = 2,963

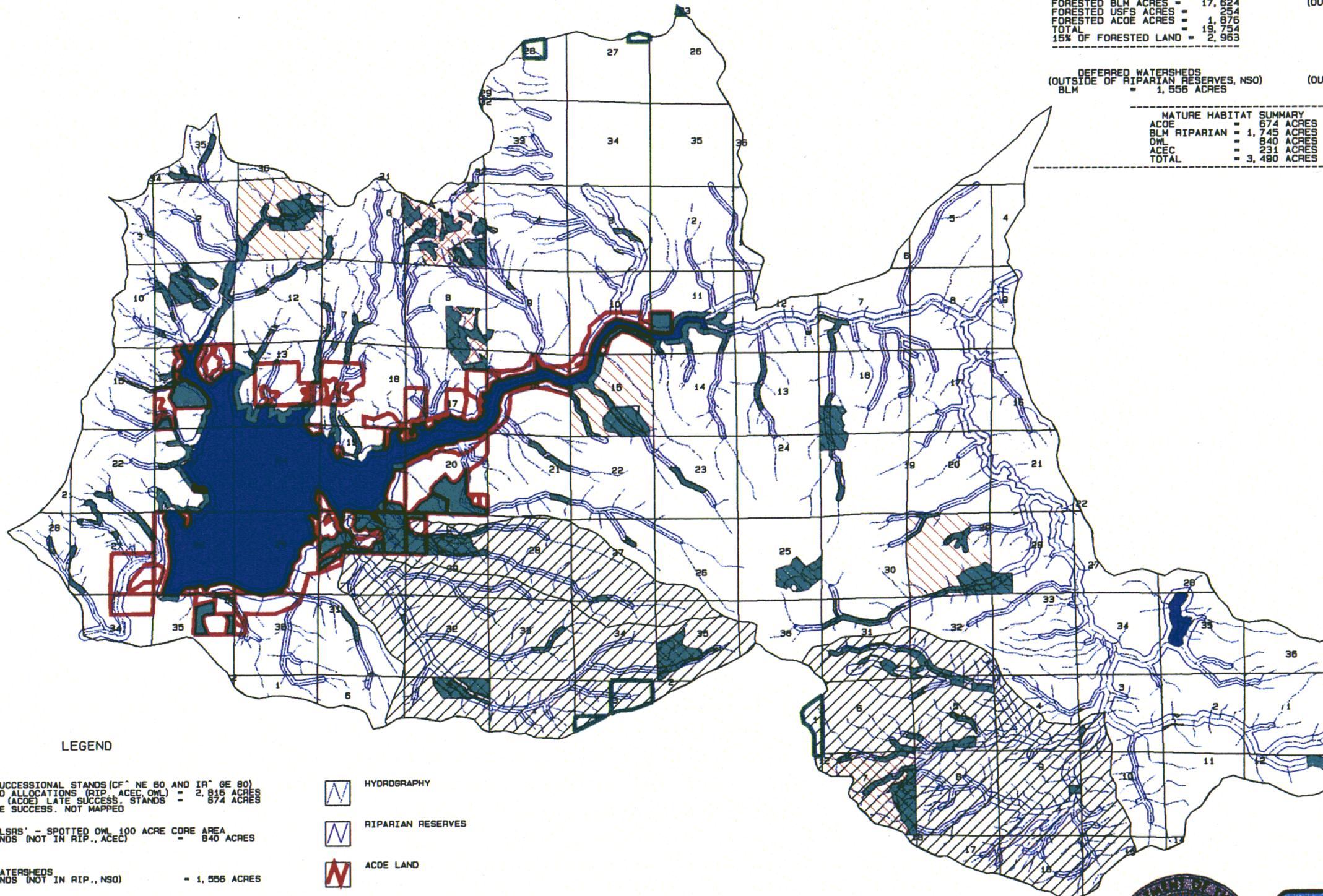
NSO CORE RESIDUAL HABITAT
 (OUTSIDE OF RIPARIAN RESERVES)
 BLM = 840 ACRES
 RIPARIAN RESERVE ACRES
 BLM GROSS = 2,917 ACRES
 BLM MATURE = 1,745 ACRES

DEFERRED WATERSHEDS
 (OUTSIDE OF RIPARIAN RESERVES, NSO)
 BLM = 1,556 ACRES

ACEC
 (OUTSIDE OF RIPARIAN RESERVES, NSO)
 BLM = 231 ACRES

MATURE HABITAT SUMMARY
 ACCE = 674 ACRES
 BLM RIPARIAN = 1,745 ACRES
 OML = 840 ACRES
 ACEC = 231 ACRES
 TOTAL = 3,490 ACRES

3,490/19,754 = 17.6%



LEGEND

- BLM LATE SUCCESSIONAL STANDS (CF NE 60 AND IR GE 80) WITHIN LAND ALLOCATIONS (RIP, ACCE, OML) = 2,815 ACRES
ARMY CORPS (ACCE) LATE SUCCESS STANDS = 674 ACRES
USFS - LATE SUCCESS. NOT MAPPED
- 'UNMAPPED LRS' - SPOTTED OML 100 ACRE CORE AREA MATURE STANDS (NOT IN RIP., ACEC) = 840 ACRES
- DEFERRED WATERSHEDS MATURE STANDS (NOT IN RIP., NSO) = 1,556 ACRES
- CONNECTIVITY/DIVERSITY BLOCK
- ACEC MATURE STANDS (NOT IN RIP., NSO) = 231 ACRES
- RESERVOIRS

- HYDROGRAPHY
- RIPARIAN RESERVES
- ACCE LAND
- USFS LAND

SCALE 1:125000

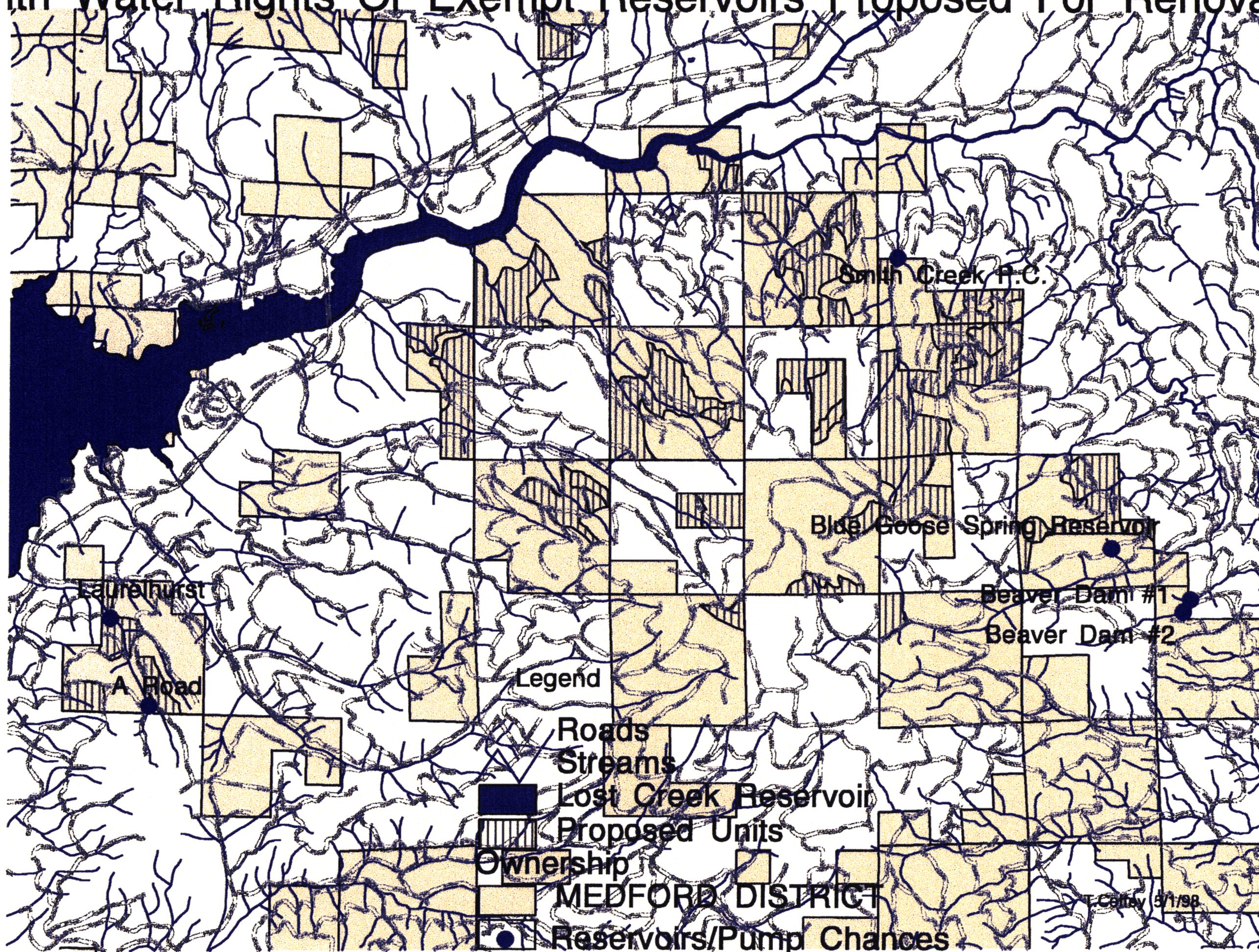


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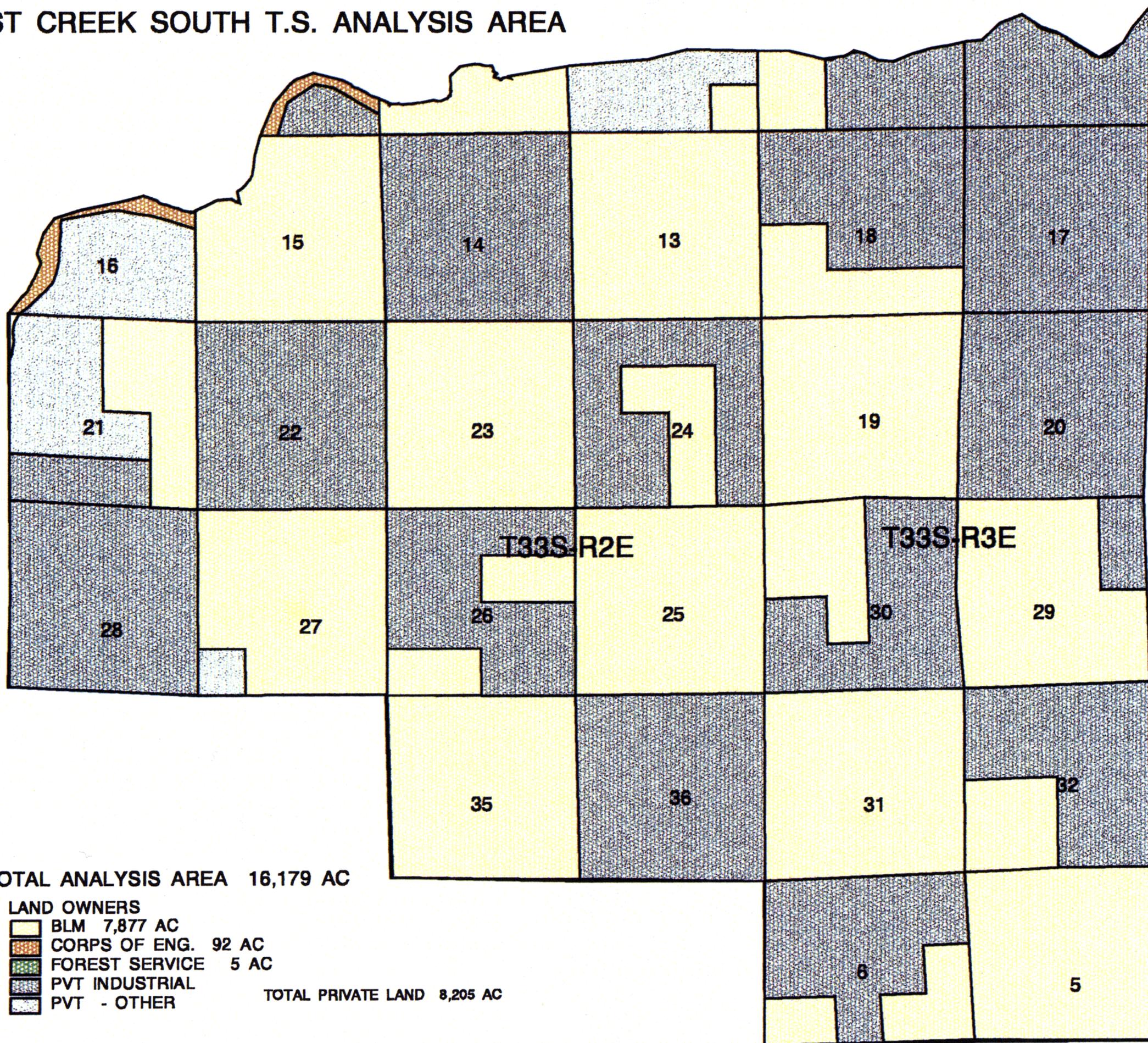
PAR 1/13/98

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Reservoirs and Pump Chances With Water Rights Or Exempt Reservoirs Proposed For Renovation



LOST CREEK SOUTH T.S. ANALYSIS AREA



TOTAL ANALYSIS AREA 16,179 AC

LAND OWNERS

- BLM 7,877 AC
- CORPS OF ENG. 92 AC
- FOREST SERVICE 5 AC
- PVT INDUSTRIAL
- PVT - OTHER

TOTAL PRIVATE LAND 8,205 AC



PAR 4/7/98