United States Department of the Interior

BUREAU OF LAND MANAGEMENT
MEDFORD DISTRICT OFFICE
3040 Biddle Road
Medford, Oregon 97504
email address: or110mb@or.blm.gov

IN REPLY REFER TO:

1792 (116)
Conde Shell EA
A6488(WHY:jl)

JUN 4 2001

Dear Interested Public:

The *Environmental Assessment* (EA) for Conde Shell is being advertised in the Medford Mail Tribune for a 30 day public review period. The proposed action would treat conifer stands that are in need of forest health restoration on approximately 1,915 acres in the Little Butte Creek Watershed east of Ashland, OR. Treatments would reduce the vegetative density of forest stands by thinning through various silvicultural prescriptions that favor desired tree species.

The primary purpose of a public review is to provide the public with an opportunity to comment on the BLM's determination that there are no significant impacts associated with the proposed action beyond those impacts addressed in the Medford District Record of Decision and Resource Management Plan.

This EA is published on the Medford District web site, www.or.blm.gov/Medford/, under "Planning Documents."

We welcome your comments on the content of the EA. We are particularly interested in comments that address one or more of the following: (1) new information that would affect the analysis, (2) possible improvements in the analysis; and (3) suggestions for improving or clarifying the proposed management direction. Specific comments are the most useful. Comments, including names and addresses, will be available for public review. Individual respondents may request confidentiality. If you wish to withhold your name and/or address from public review or from disclosure under the Freedom of Information Act, you must state this prominently at the beginning of your written comment. Such requests will be honored to the extent allowed by law. All submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, will be made available for public inspection in their entirety.

All comments should be made in writing and mailed to Bill Yocum, Ashland Resource Area, 3040 Biddle Road, Medford, OR 97504. Any questions should be directed to Bill at (541)618-2384.

Sincerely,

Richard J. Drehobl
Field Manager
Ashland Resource Area

Enclosure (as stated)

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

Environmental Assessment

FOR

Conde Shell

EA No. OR-110-01-023

This environmental assessment (EA) for the proposed Conde Shell was prepared utilizing a systematic interdisciplinary approach integrating the natural and social sciences and the environmental design arts with planning and decision making.

for Richard J. Drehobl
Ashland Field Manager

5-30-01
Date

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
ASHLAND RESOURCE AREA
EA COVER SHEET

Project Name and Number: Conde Shell OR-110-01-023

List of Preparers	Title	Responsibility
George Arnold	Wildlife Biologist	USFWS Wildlife Consultation
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Joe Hoppe	Realty Specialist	Land Use Authorizations
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Jeannine Rossa	Fisheries Biologist	NMFS Fish Consultation
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Brad Tong	Botanist	Plants, USFWS Consultation
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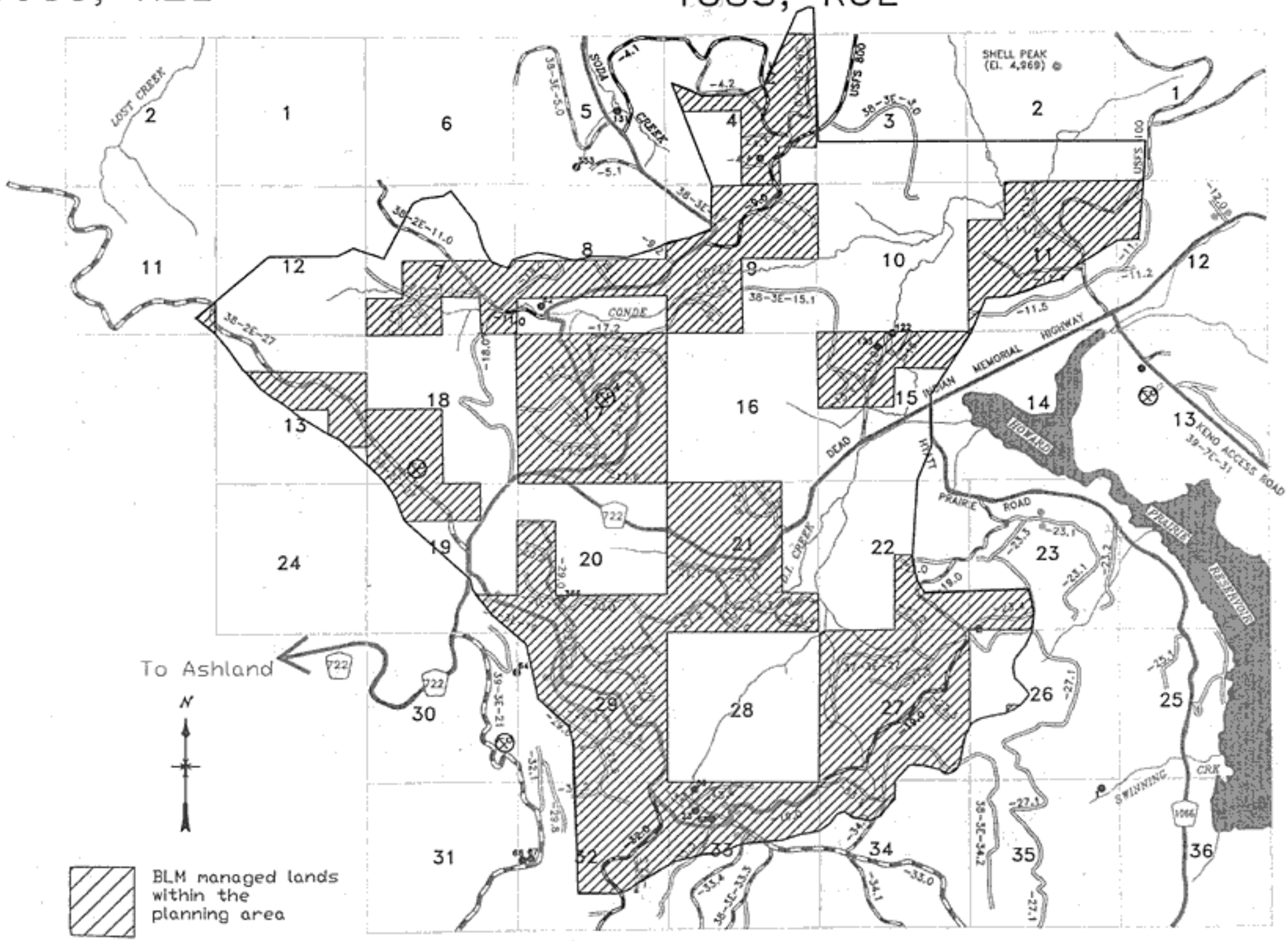
Bill Yocum	Planning & Environmental Coordinator	NEPA
Larry Zowada	GIS Analyst	GIS maps

ASHLAND RESOURCE AREA
Conde Shell

TABLE OF CONTENTS

CONDE SHELL VICINITY MAP



Environmental Assessment
for
Conde Shell

CHAPTER 1

INTRODUCTION

The Bureau of Land Management (BLM) proposes to implement forest management activities in the Little Butte Watershed. Proposed activities in the Conde Shell area would move the forest ecosystem toward a healthy, sustainable condition by reducing vegetation density. The Conde Shell area encompasses approximately 7,240 total acres of which BLM administers approximately 5,147 acres. All planned activities are located on public lands administered by the BLM.

This document complies with the Council on Environmental Quality's (CEQ) Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (NEPA; 40 CFR Parts 1500-1508) and the Department of the Interior's manual guidance on the National Environmental Policy Act of 1969 (516 DM 1-7).

A. PURPOSE AND NEED

An interdisciplinary team (ID Team) of resource specialists was formed to design projects that:

> Improve forest health - Reduce tree mortality and the risk of high intensity wildfire by restoring the vigor, resiliency, and stability of forest stands.
>
> Provide a sustainable supply of timber and other forest products.
>
> Manage developing forest stands to promote desired tree species, tree survival, tree growth, achieve a balance between wood volume production, quality of wood, and timber value at harvest.

The Ashland Field Manager also directed the ID Team to: 1) comply with the Record of Decision (ROD) for the Medford District Resource Management Plan; and 2) design projects that minimize the financial burden to taxpayers by utilizing the value of existing resources.

Two alternatives were developed for this project. A description of these alternatives can be found in Chapter 2 of this document.

B. CONFORMANCE WITH EXISTING LAND USE PLANS

The proposed activities are in conformance with and tiered to the *Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (USDI, USDA 2001) and the *Medford District Record of Decision and Resource Management Plan* (RMP) (USDI 1995b). These Resource Management Plans incorporates the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl and the Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl* (NWFP) (USDA and USDI 1994). These documents are available at the Medford BLM office and the Medford BLM web

site at <http://www.or.blm.gov/Medford/>.

C. 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).

D. DECISIONS TO BE MADE ON THIS ANALYSIS

This environmental assessment (EA) is being prepared to determine if the proposed action or 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.

The Ashland Resource Area Field Manager must decide:

- Whether or not the impacts of the proposed action are significant to the human environment beyond those impacts addressed in previous NEPA documents. (If the impacts are determined to be insignificant, then a Finding of No Significant Impact (FONSI) can be issued and a decision can be implemented. If any impacts are determined to be significant to the human environment, then an Environmental Impact Statement must be prepared before the Manager makes a decision.)
- Whether to implement the proposed action alternative or defer to the no action alternative.

E. ISSUES OF CONCERN

The following issues were identified throughout the scoping process. All issues were reviewed by the ID Team. Issues that directly relate to the proposed action were analyzed in detail.

a. Dense Stands/Forest Health - Many of the stands are overly dense because of fire exclusion. Dense stands are not vigorous (i.e., slow growth rates, too much competition for water, nutrients, and sunlight) and are more susceptible to insect infestation and high intensity wildfire. Dwarf mistletoe disease has reached epidemic proportions in Douglas-fir trees in portions of the Conde Shell area. Shade intolerant tree species are also declining in number.

b. Wildlife - Overall reduction of snags and forest stand canopy closures over large landscapes would reduce habitat for some wildlife species. Logging operations would result in localized, short-term noise disturbances affecting wildlife (e.g., big game and nesting birds).

c. Aquatic - Non-point source pollution (sedimentation) from logging activities could degrade the aquatic ecosystem (e.g., reduced water quality for salmon, steelhead, and trout).

d. Invasive, Nonnative Species - Activity and disturbance in an area could increase the spread of nonnative species, such as star thistle in open environments of the project area.

CHAPTER 2
Alternatives

A. INTRODUCTION

This chapter describes the proposed action alternative and the no action alternative. This chapter also outlines specific project mitigation features that are an essential part of the project design.

The Ashland Resource Area has developed a proposed action designed to meet the objectives outlined in the Little Butte Creek Watershed Analysis (pages 204-208) and in accordance with the best management practices as outlined in the Medford District RMP (pages 149-177).

B. PROPOSED ACTION ALTERNATIVE

This alternative proposes to treat conifer stands that are in need of forest health restoration. Treatments would reduce the vegetative density by thinning through various silvicultural prescriptions that favor desired tree species. Variance in silvicultural prescriptions results from changes in the vegetation condition of the stand. Silvicultural prescriptions are located in the EA file. The EA file is available for review by calling the Ashland Planning Department at 541-618-2384. Proposed activities (silvicultural method, yarding systems, fuels mgt.) in harvest units and size are listed in Appendix A (Table A-1).

This proposed action alternative includes project design features (PDFs). Included below are PDFs for the purpose of mitigating, reducing, or eliminating anticipated environmental impacts. Analysis supporting the inclusion of PDFs can be found in Appendix D and E of the RMP: Best Management Practices and Silvicultural Systems.

1. Conifer Treatments

The Conde Shell area encompasses approximately 7,240 total acres of which BLM administers approximately 5,147 acres. The Conde Shell area is presently composed of the following vegetation types: 6% of the land-base is grassland, 2% hardwood/woodland, 21% early seral conifer species, 1% small pole timber, and 70% large pole and mature timber. This proposal affects approximately 1,915 acres of forest planned for commercial thinning.

Types of commercial treatment prescriptions are: 1) mistletoe; 2) pine; 3) mixed conifer; and 4) Douglas-fir (wet and dry sites). Detailed prescriptions with a detailed map are located in the EA file.

The thinning of commercial timber stands proposed under this project would reduce the aerial component of fuels that is currently present. The fuels reduction work (prescribed fire), which is proposed for the majority of these stands would reduce the ladder and surface fuels. This type of work is proposed in order to reduce the existing fuel hazard and to mitigate the increased fuel loadings created by thinning operations. The increase in fuel loadings due to thinning operations would be the highest in stands where the mistletoe, dry Douglas-fir, and pine site prescriptions are implemented. These prescriptions represent approximately 7% of the area proposed for treatment in the Conde Shell project area. These prescriptions would be implemented in areas where fuels reduction work is priority.

An array of treatments to reduce fuels are proposed for the project area. The type of treatment utilized is dependent on existing and projected fuel loadings, existing vegetative conditions, slope, and access. Treatments include mechanical (slashbuster), manual treatment, prescribed burning or a combination of these treatments.

Mechanical treatment of ladder fuels is limited to slopes less than 50%. Manual treatment involves hand cutting

of existing ladder fuels and then hand piling this material so it can be burned. This type of treatment would be utilized in the majority of stands where fuels treatment is utilized.

Prescribed burning includes, underburning, broadcast and handpile burning. Handpile burning would be used in the majority of areas which have been manually treated. High fuel loadings in these areas make underburning or broadcast burning not possible due to the high probability of mortality to the residual stand. This type of burning takes place in the late fall and winter.

Underburning is the preferred method of fuels reduction work in thinned stands. Due to access and slopes the majority of stands would utilize underburning to reduce fuel loadings. Under burning is highly effective because it reduces a large amount surface and ladder fuels. This type of burning would occur in late summer, fall and spring. Broadcast burning would be used to restore native vegetation in meadows. This type of burning would occur in the late summer, fall or early winter.

Future maintenance of all areas treated in the project area would be needed in order to maintain low fuel loadings and species dependent on fire. Underburning is the preferred method for maintaining these areas. Limited to no access to these areas would determine if underburning can be used. The risk of escape is a major factor when conducting this type of burning operation. Without access there is an increase risk of escape due to the lack of availability and mobility of people, equipment and water. If access is determined to be a problem, future treatments would have to be done manually.

Prescribed burning operations would follow all requirements of the Oregon Smoke Management Plan and the Department of Environmental Quality Air Quality and Visibility Protection Program. Burning operations would be postponed if Medford or Grants Pass are under a "yellow" or "red" wood burning advisory.

Any areas planned for fuels treatment may be reexamined by resource specialists at any stage of treatment to determine if the planned fuels treatment is still applicable. At the discretion of resource specialists, planned treatments may be changed to better meet the objectives outlined in this EA. Proposed changes would be limited to treatments allowed under this EA or amendments to this EA.

Measures to reduce the potential level of smoke emissions from the proposed burn sites would include mop-up to be completed as soon as practical after the fire, burning with lower fuel moisture in the smaller fuels to facilitate their quick and complete combustion, burning with higher fuel moisture in the larger fuels to minimize consumption and burn out time of those fuels, and covering hand piles to permit burning during the rainy season where there is a stronger possibility of atmospheric mixing and/or scrubbing.

To minimize loss in soil productivity and surface erosion, underburning would be planned and scheduled to result in low intensity burns, whenever possible, to reduce the loss of organic matter, nutrients, and subsequent site productivity.

In order to encourage diversity and plant regeneration, fire may be used to expose mineral soils in isolated pockets. Burn plan targets would be set to minimize effects on soil productivity.

2. Roads

New Road Construction

No new roads are planned for this project.

Short temporary roads (referred to as operator spurs) may be needed in a few instances. The length of operator spurs normally varies between 100 feet and 500 feet. They would be natural surfaced roads that would be constructed, used, and decommissioned during the dry season of the year, usually June 15 to October 15.

Road Decommissioning
Some existing roads would be decommissioned as listed in Appendix B.

Types of decommissioning are as follows:

1. Natural Decommission - Some roads are presently well drained and have vegetation growing on them. They may also have trees and brush encroaching from the sides and trees that have fallen across them. Sections of these roads would be allowed to decommission naturally but may include some selective ripping, removal of drainage structures, construction of water bars and barricades.

2. Mechanical Decommission - Roads would be decommissioned mechanically. This usually includes ripping, removing drainage structures, seeding and/or planting, mulching, constructing water bars and barricades.

Helicopter landings
Helicopter landings on BLM land would be treated to reduce soil erosion. Treatment would be dependent on site conditions and would include one of the following:

1. Subsoil/till or rip, then mulch and seed with native grasses or other approved seed.
2. Surface with durable rock material.
3. Where natural rock occurs no treatment may be necessary.

Fill slopes of helicopter landings would be seeded with native grasses or other approved seed mixes and mulched except where rock occurs.

Hauling Restrictions
A seasonal hauling restriction would be required on natural surfaced (dirt) roads during the wet season (usually October 15 - June 15). This would protect the road from damage and decrease the amount of sedimentation that would occur. Some variations in these dates would be permitted dependent upon weather and soil moisture conditions of the roads. Refer to Appendix B for all hauling seasonal restrictions.

Rock Surfacing and Quarries
Rock would be used to stabilize and minimize erosion on selected roads and landings. Rock would be obtained from one or more of the following existing quarries which are located in SW1/4NE1/4 Section 17, and SE1/4SW1/4 Section 18, T.38 S., R.3 E. Roads would be surfaced as shown in the road summary table in Appendix B.

Dust Abatement
Dust abatement would provide driver safety and protect the road surface by stabilizing and binding the aggregate road surface. Water, lignin, magnesium chloride, road oil, or Bituminous Surface Treatment (BST) would be used. Oil or BST may appear to be a permanent surface improvement, however after log and rock haul the road may be allowed to return to a rocked road.

Road Use Agreements

Existing road agreements are between by private companies and BLM for access. Road use agreements' M-660, M690, and M-800, would be used for access to BLM land.

Project Area Mileage Summary for BLM Controlled Roads

Total miles of BLM controlled roads before the project:	=	50.6	miles
Proposed new road construction:	=	0	miles
Proposed decommissioning of existing roads:	=	05.0	miles
Total miles closed with existing seasonal or year round gates:	=	13.9	miles
Total miles closed with new gates/barrricade	=	03.7	miles
Total miles of BLM controlled roads after the project:	=	45.6	miles
Total miles of roads closed after the project:	=	22.6	miles
Total miles of roads opened after the project:	=	23.0	miles

3. Riparian/Streams

Perennial and intermittent streams are present in the project area. Riparian Reserve boundaries for fish-bearing perennial streams extend from the edge of the active stream channel (where side slope meets stream bank) to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of riparian vegetation, or to a distance equal to the height of two site-potential trees, or 300 feet slope distance (600 feet total, including both sides of the stream channel), whichever is greatest (NWFP ROD, pg. C-31). Riparian reserves for non-fish-bearing perennial streams extend "...a distance of one site potential tree, or 150 feet slope distance (300 feet total, including both sides of the stream channel), whichever is greater." For intermittent streams, Riparian Reserve boundaries on each side of the channel are "...a distance equal to the height of one site-potential tree, or 100-feet slope distance...whichever is greatest." For wetlands greater than one acre, follow Riparian Reserve widths identified in the ROD Standards and Guidelines. Designate Riparian Reserve widths of 100 feet slope distance from the outer edge of wetlands and springs less than one acre. Designate Riparian Reserves to include active and potentially active landslides. Buffer any management activities 200 feet above, to the bottom of slide deposits, and 75 feet along the sides of active and potentially active landslides.

Riparian Reserves have been mapped and the widths assigned according to the NWFP and Little Butte Watershed Analysis. In the event that new areas such as springs, wetlands, and ponds are discovered the below guidelines would apply.

No commercial treatments are planned for within the Riparian Reserves in the Project area. Riparian Reserve treatments would include precommercial thinning and underburning.

- Precommercial thinning in riparian reserves would only occur after commercial and precommercial thinning of the upland areas has been completed. No trees 8 inches in diameter or greater would be cut during precommercial thinning. Staff specialists would be consulted prior to any precommercial thinning.
- Maintain all existing downed wood.
- Leave all snags and horizontally-leaning trees except where they need to be felled for safety reasons (per OSHA regulation) these logs would remain on site.
- Leave all riparian hardwoods.
- Riparian Reserves that would be part of prescribed burn would be monitored by staff specialists. In addition, no ignition would occur within Riparian Reserves, but a backing fire would be allowed to burn through in most places. Fire lines would be minimized or avoided in order to prevent the creation of "mini roads" that could route sediment into the creek. Foam would not be used in

Riparian Reserves.

The following no-treatment zones would be specified for the Project area.

- no treatments within 50 feet of each side of known fish-bearing streams in units where the average conifer height is less than 15 feet;
- no treatments within 25 feet of each side of known fish-bearing streams in units where the average conifer height is greater or equal to 15 feet;
- no treatments within 25 feet of each side of non-fish bearing streams;
- no treatment zones are to be measured from the edge of the stream channel;
- leave all trees within the active stream channel.
- no treatment if riparian vegetation and stream channel are in properly functioning condition.
- In draws that do not require Riparian Reserves, leave trees in the center of the draw bottoms for soil stability (10 feet on each side is recommended);
- Leave trees directly adjacent to areas of unstable soil or visible slumping from the waters edge to the slope break;
- Fire line would not be constructed within the "no-treatment zone" except for the occasional underburn where a fire line is necessary at the bottom of the unit. In this case, the fire line would run perpendicular to the stream, extending up to the active channel. Areas proposed for underburn would be reviewed by a BLM specialist;
- Slash shall not be piled or placed within the channel bottoms or streams, or within the no treatment zones identified above.

Additional activities that would occur within the Riparian Reserve under this project would be designed to maintain the ecological health of watersheds and aquatic ecosystems according to the Aquatic Conservation Strategy (ACS) objectives (Appendix D).

- Several miles (~3) of road would be decommissioned in the Riparian Reserve using mechanical or natural methods. Whatever the method, road drainage would not route sediment directly into streams, draws, or swales.
- Culverts would be repaired, replaced, or removed within the Riparian Reserve. These activities would occur between June 15 and September 15.

4. Threatened/Endangered Wildlife and Critical Habitat

There are no known northern spotted owl nests within the project area. If any new pairs of spotted owls are found before or during the ground disturbing period, a seasonal restriction on treatment activities would be placed within 0.25 miles of the center of activity for the owl sites. This restriction would be in effect from March 1 through June 15 for disturbance activities, such as hauling, and from March 1 through September 30 for removal of habitat within the restricted area. This restriction could be lifted on an annual basis if protocol surveys by the BLM indicate that the site is not reproductive in a given year.

5. Special Status Species, Species to be Protected Through Survey and Manage Guidelines, and Protection Buffer Species

Species to be Protected Through Survey and Manage Guidelines are species identified in Appendix C of the RMP. The standards and guidelines contain four components, and priorities differ among them. They are to: 1) manage known sites, 2) survey prior to ground-disturbing activities, 3) conduct extensive surveys, or 4) conduct general regional surveys.

Species to be protected through Protection Buffers have additional standards and guidelines from the Scientific

Analysis Team Report for specific rare and locally endemic species, and other specific species in the upland forest Matrix (ROD). When located, the occupied sites need to be protected with buffers as identified in the ROD.

Protect the six known great gray owl nests. These sites would receive ¼ mile protection zones (approx. 125 acres), which would be managed as Late-Successional Reserves. Designate a ¼ mile "protection zone" around any additional great gray owl nest sites found before the start of project implementation. A seasonal restriction would be in effect from March 1 through July 15 for any treatment activities and hauling within 1/4 mile of active nest sites. Provide no-treatment buffers of 300 feet around meadows and natural openings.

There are currently no known goshawk sites. Any identified northern goshawk nests or activity centers that are located would receive no treatment buffers of approximately 30 acres.

Bat roosting and hibernacula sites referred to in the NWFP, including caves, mines, wooden bridges, and old buildings, are not known to occur within the project area. If any mines are found, mine adits and shafts that serve as roosts, maternity colonies or hibernacula for any of the five species of bats listed as FSEIS ROD, Survey and Manage/Buffer Protection Species, would be protected with 250 foot no treatment buffers and 1,000 foot no-treatment buffers for Thompson's big-eared bat maternity colonies. The silvicultural prescription for this project retains large snags, which addresses protection of roosting sites for species of bats which use snags.

Under the NWFP, surveys for red tree voles and Siskiyou mountains salamanders are not required in this project because it is outside the known and suspected geographic ranges of these species

The 53 occurrences of the Northwest Forest Plan species would be buffered with a 100 ft radius buffer in accordance with Medford BLM District Office Instruction Memorandum OR110-2000-8 dated 23, June, 2000. This buffering provides protection from physical disturbance and microclimate alterations associated with timber harvestactivities.

Cimcifuga elata:
This vascular plant Special Status Species occurs in moist areas in coniferous forests. The periphery of the one known occurrence within the proposed harvest units ,T38S, R3E, SEC 29 would be buffered with a 100-150 ft variable radius buffer be subjected to timber harvest activities. In order to minimize disturbance to this population, a botanist would coordinate the layout of skid trails through the periphery of the *Cimcifuga elata* population (T38S, R3E, SEC 29) with the timber sale administrator. Skidding would be restricted to established and well delineated trails laid out in such a manner as to minimize disturbance to the currently existing *Cimcifuga elata* plants.

6. Harvest and Logging Systems
Only logging systems which meet all of the project design features would be used in these projects.
All units would be yarded in such a way that duff, litter, and coarse woody debris remaining after logging would be maintained at or greater than current levels as is operationally possible to protect the surface soil and maintain productivity.

Wherever trees are cut to be removed, directional felling away from draw bottoms would be practiced. Maximum operational suspension should be practiced to alleviate gouging and other disturbance on steep draw side slopes and headwalls. Trees should be felled to the lead in relation to the skid roads. The intent of falling to the lead is to minimize the yarding damage to leave trees and regeneration under a conventional groundbased system.

All skid road locations would be approved by BLM. Maximum area in skid trials would be less than 12%. Existing skid roads should be utilized when possible. Skid road locations would avoid ground with slopes over 35%. The

intent is to minimize areas affected by tractors and other mechanical equipment (disturbance, particle displacement, deflection, and compaction) and thus minimize productivity loss.

All skid roads would be water barred according to BLM standards. The intent is to minimize erosion and routing of concentrated rain and snow melt to streams.

Tractor yarding would normally take place when soil moisture is less than 20 percent at a depth of four inches, usually June 15 to October 1. The intent is to minimize compaction by operating when soil moisture is less than optimum needed for maximum density.

Tractor yarding would be allowed on snow when the snow pack is sufficient to protect the soil. Tractor yarding would be allowed to start when there is a minimum of a twenty-four (24) inch snow depth. No logging would be allowed once the snow depth deteriorates below eighteen (18) to protect the soil from compaction. Skid trail spacing and soil moisture requirements would be waived if tractor yarding on snow occurs.

Every effort should be made to maintain canopy cover over skid roads. The intent is to minimize snow-melt on disturbed earth.

For all cable yarding, maximum operational suspension would be maintained on slopes greater than 50 percent. Minimum corridor widths (generally less than 15 feet in width) would be utilized to assure silvicultural prescriptions and objectives are met.

Skyline and tractor yarding would be avoided up and down bottoms of draws. The intent is to minimize erosion in existing areas of concentrated surface flow.

7. Wildlife Trees/ Dead and Down Material

Reserve from harvest a minimum of 2 snags greater than 16" DBH per acre (where possible). Retention of all snags greater than 16 inches DBH within the interior of the stands would mitigate impacts to pileated woodpeckers, saw-whet owls, and several of the bat species that use large snags as roosts.

Do not target for removal large, broken-top trees and large snags with loose bark on ridgetops. Retain and protect these structures where possible.

8. Cultural Resources

A field survey was conducted for sites of cultural value such as historical or prehistorical ruins, graves or grave markers, fossils, or artifacts. The survey was reviewed by the District Archeologist and the State Historic Preservation Officer was notified of the result. Sites would be protected to retain their cultural value. If additional sites are located, these also would be protected.

9. Invasive, Nonnative Species

To minimize the spread of weeds, vehicle movement on gated and newly constructed roads would be limited to the dry season except on roads where alternative seasons of use are required to implement the project. Seeding of native grasses and/or adapted grasses on disturbed soil (e.g., new road construction, road ripping, log landings, prescribed burns, etc.) would be required. Seeding of native grasses and/or adapted grasses on disturbed soil created by prescribed burns would be evaluated on a case by case basis.

Diffuse knapweed has been located in a proposed treatment area in the SE¼SE¼ Section 19, T.38S.,R3E. If

necessary, chemical control would be employed, as outlined in the Medford District's Integrated Weed Management Plan and Environmental Assessment (EA) #OR-110-98-14, tiered to the Northwest Area Noxious Weed Control Program Environmental Impact Statement prepared 12-85 and amended 3-87.

Prescribed grazing also may be effective in the control of noxious weeds. Strict attention must be payed to the duration and season of use in which the grazing takes place. Grazing should be imposed to get the greatest consumption of above ground biomass in the shortest period of time within reason. The purpose of this prescribed grazing is to eliminate weeds before they can set seed and provide an open herbaceous canopy for shorter statured native species. When possible interseeding (no till drill) of summer dormant perennial grasses in the fall following a hot burn should take place. Where interseeding is not feasible broadcast seeding should take place. Additional seeding should be done on areas needing additional plants and other species of grasses and forbs. The first growing season following the fall burn and seeding, grazing with cattle should begin in the spring.

10. Recreation
Limit hauling on the southern two (2) miles of the Conde Creek Road, 38-3E-17 during a mid-July weekend to minimize any impacts with a planned sports car event.

Limit hauling during the months of November through mid-April on the portions of the Buck Prairie Road used for the ski trails.

11. Long term monitoring:
A total of 10 photopoints (plots) would be uniformly established throughout the *Cimcifuga elata* population and marked prior to timber harvest activities. These photopoints would be monitored at the end of one year, three years, and five years. Four photographs would be taken at each plot, one in each cardinal direction, and compared over time to determine the affects of timber harvest activities (thinning) on the relative number, vigor, and reproductive status of *Cimcifuga elata* plants within the harvested stand as well as in the adjacent clearcut. Monitoring should occur at approximately the same time each year, June-August, to ensure that all of the plants are fully leafed out and can be readily identified.

C. NO ACTION
Analysis of this alternative provides a baseline against which the effects of an action alternative can be compared. For this EA, the no action alternative is defined as not implementing any vegetation management projects.

D. ALTERNATIVE CONSIDERED BUT ELIMINATED FROM ANALYSIS
In addition to the alternatives analyzed in detail in this EA, the ID team considered the removal of all mistletoe infested trees.

1. Wildlife Impacts
A significant percentage (estimated 30%-50%) of spotted owls in the southwest Oregon region use mistletoe brooms for nesting. Douglas-fir dwarf mistletoe is a naturally occurring tree pathogen which creates habitat used by many wildlife species. Mistletoe provides food, shelter, and nesting for many wildlife species including several spotted owl prey species. Elimination of mistletoe would not be consistent with promoting the ecological health of the watershed.

2. Aquatic Impacts
Removing the infested trees from Riparian Reserves would not meet the objectives of the Aquatic Conservation

Strategy. Removing large-diameter trees from streamside areas would reduce the amount of large woody debris available for fish habitat. Habitat complexity, overwintering habitat, spawning gravels, and nutrients would all be negatively affected.

CHAPTER 3
Affected Environment

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 outlines 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.

GENERAL DESCRIPTION OF THE PROPOSED PROJECT AREA

A description of the lands and resources in the Ashland Resource Area is presented in Chapter 3 of the Final Medford District Resource Management Plan/Environmental Impact Statement (RMP 1995). Also, a detailed description of the Little Butte Creek watershed may be found in the Little Butte Creek Watershed Analysis, completed in November 1997. This document is available at the Ashland Resource Area, Medford District BLM Office and on the Medford BLM web site at <http://www.or.blm.gov/Medford/Medwatershed.html>.

A. VEGETATION

The vegetation native to the watershed is a result of time, the unique geology of the area, and human influences. Over the coarse of thousands of years, native inhabitants regularly used fire on the landscape for a wide variety of purposes. Natural disturbances such as lightning fires, windstorms and drought contributed to the variation. The lower elevation areas would have been dominated by grassland, oak savanna, and open oak/pine woodland. In the upper valley/canyon area prime black oak woodland probably existed. Because of fire exclusion these areas now appear to be closed canopy Douglas-fir forest. Many mixed-conifer stands of the canyon and high plateau sections were comparatively open, with a higher proportion of mature ponderosa and sugar pine than at present. Infrequent, stand-replacing natural fires on the high plateau may have played a dominant role in that portion of the watershed.

Due to frequent disturbance, historic forest lands were generally more open, had fewer trees per acre, trees of larger diameter, and a different species composition. These stands generally had more large diameter ponderosa pine, oak species, incense cedar, and native grasses. In the moist microsites where Douglas-fir is better adapted, the forest stands probably developed old-growth forest characteristics because of the frequent disturbance regime. Disturbances were probably as frequent as every 1 to 25 years. In the project area, many of the commercial forest stands originated between 1854 and 1929. Most of the forest stands became established within 10 years after a fire although the harsher sites may have taken 30 to 40 years to become forested. Because the last, large fires were forest-replacing in nature, individual timber stands tend to be fine grained. This means that there are many trees of the same age class and almost equal in height with some older trees scattered throughout the stand. The majority of the trees in the project area are between 70 and 145 years old. However, there are 146 to 363 year old trees in fewer numbers. The oldest trees found were 341 and 363 years old.

FUELS The thinning of commercial timber stands, approximately 2,480 acres, proposed under this project would reduce the aerial component of fuels that is currently present. The fuels reduction work (prescribed fire), which is proposed for the majority of these stands would reduce the ladder and surface fuels. This type of work is proposed in order to reduce the current fuel hazard exist and to mitigate the increased fuel loadings created by thinning operations. The increase in fuel loadings due to thinning operations would be the highest in stands

where the mistletoe, mixed conifer, and pine site prescriptions are implemented. These prescriptions represent approximately 38% of the area proposed for treatment in the Conde Shell project area. Stands in which these prescriptions are implemented are where fuels reduction work are a priority and where fuels work would occur under this project.

The existing surface fire behavior fuel model (*Fire Behavior Field Reference GUIDE, 1992)* in the stands where these prescriptions are implemented is represented by a fuel model 8 and 9. It is anticipated that the surface fire behavior fuel model would be changed to a fire behavior fuel model 11(slash fuel model). Rates of fire spread and flame length are higher in fuel model 11 which would increase potential mortality to the residual stand and higher resistance to control in the event of a wildfire. The remaining proposed thinning prescriptions (white fire prescription) is not anticipated to change the existing fire behavior fuel model to a fuel model 11 except for where thinning of noncommercial material is proposed. Approximately 100 acres of this prescription is proposed. Prescribed fire would be used in areas where fuel models have been changed to a fuel model 11 to reduce existing fuel hazard.

1. Forestry

The project area is on the northeast portion of the Dead Indian Plateau. On the eastern boundary there is a main ridge that is oriented northwest/southeast in direction. Just north of where the Dead Indian Road intersects this ridge, another ridge branches off of and runs to the east of the main ridge. As a result, there are south and north to northeast facing aspects in the project area which influences the growing conditions for vegetation. The ridgetops also tend to be very rocky. On these rocky areas with south to east aspects, small areas of grassy white oak woodlands are common. The south facing slopes also have more ponderosa pine and Douglas-fir in the forest composition. The cooler north facing slopes have a higher species composition of white fir with Pacific yew in the understory. The majority of the forest is in the white fir series but mixed species stands are also present (white fir, Douglas-fir, sugar pine, ponderosa pine, and incense cedar). There is one ponderosa pine series forest on a flat lowland northwest of Howard Prairie Lake adjacent to grasslands.

There are 5,147 acres of federally-owned land in the Conde Shell project area. The project area is presently composed of the following vegetation types: 3% of the land-base is woodland; 3% small pole timber; 6% grassland; 8% large pole timber; 20% early seral conifer species; and 60% mature timber.

The present day vegetation is a result of natural succession, the geology and soils of the area, and anthropogenic influences. Over the coarse of thousands of years, native inhabitants regularly used fire on the landscape for a wide variety of purposes. Natural disturbances such as lightning fires, windstorms, drought, insects, and forest pathogens have helped create the varied forest structure and species composition. Logging and grazing early in the century to the present day has also played a part in creating the present day forest stands.

Historically, the forests were probably more open, had fewer and larger trees per acre, and of a different species composition. The present day forests are uneven-aged. A 91 tree sample shows trees in every 10 year age class from 60 through 262 years of age. A 341 year-old white fir tree was also sampled. This could be a result of the more open condition and the steady influx of natural tree regeneration. Because of the many tree age classes, there is diversity of diameter and height classes (resulting in

vertical crown structure),and tree crown sizes.

The early seral and small pole conifer forests are in the stem exclusion stage of development. Sometimes large diameter trees are found with early seral trees because of past shelterwood and selection silvicultural systems used. The large pole and mature forest stands are in the understory reinitiation stage of forest development as a result of tree mortality, other natural disturbances, and past selection harvesting.

Even though many of the forest stands have been selection harvested, stocking levels remain high in the majority of the forest stands. This is a result of the lack of large scale disturbance over the landscape. Individual tree mortality is occurring as a result of bark beetles, Douglas-fir dwarf mistletoe, and root rots. Merchantable trees per acre range from 39 to 471 trees. The average for the inventoried stands is 190 trees per acre. Basal area per acre ranges from 167 to 300 square feet. Average radial growth for the past ten years is .82 inches. Most stands in the project area have a relative density index of .500 or greater and this indicates that physiologically the trees are at the point of suppression and mortality. The average tree vigor index, as measured by leaf area index is 72 for Douglas-fir and 40 for ponderosa pine. Trees with vigor indices below 30 will succumb to attack from bark beetles of relatively low intensity. Trees with vigor between 30-70 can withstand progressively higher attacks but are still in danger of mortality from the insect attacks. Trees with vigor between 70-100 can generally survive one or more years of relatively heavy attacks and trees with indices above 100 cannot be killed by bark beetles (Waring, 1980).

There are 3 tree series in the project area: white fir, Douglas-fir, and ponderosa pine. The ABCO (white fir)/herb, ABCO/PSME (Douglas-fir), and ABCO/TABR (Pacific yew) plant associations are the most prevalent white fir associations. Drier sites or south aspects tend to have the PSME/ABCO and PIPO (ponderosa pine)/PSME plant associations.

Over time, subtle changes in species composition and stand structure are occurring over the landscape. Some trees with old-growth characteristics are dying as a result of increased competition with second growth trees for limited resources. Douglas-fir dwarf mistletoe has killed individual, or small patches of large diameter Douglas-fir trees. More widespread is the decline of white fir across the landscape. Where stand density is high, bark beetles have killed individual or small patches of trees. Root rot fungus has also killed patches of trees. As a result, white fir mortality can be seen in every forest stand. White fir, the most shade tolerant species next to Pacific yew, has become more prevalent than Douglas-fir, pine species, and incense cedar because of this characteristic. Grass species quickly fill in the understory whenever a gap occurs in the tree canopy layer. Pocket gopher populations are high in the project area making it difficult to grow tree seedlings.

The overall average amount of coarse woody material (CWM) is 15.7 tons per acre. The CWM stem diameters range in size from 3 to 51 inches at the large end and average 32 feet in length. CWM is most abundant in decomposition class 5.

2. Bureau Special Status Species

All of the proposed activity areas were surveyed for Bureau Special Status and Survey and Manage vascular plants as well as the federally listed Fritillaria gentneri during the 1997 and 1998 field seasons by qualified botany contractors. No populations of Fritillaria gentneri were located during the course of the surveys. Surveys documented one occurrence of the Bureau 'sensitive" species Cimcifuga elata.

The one occurrence of the Bureau "sensitive" plant *Cimcifuga elata* occupies a clearcut bordered on two sides by a conifer stand. The population extends from the opening into the adjacent stand which contains proposed timber sale units. The number and density of plants in the opening is greater than the number and density of plants located on the periphery of the population within the conifer stand. The discrepancy in the number of plants in the opening and the number of plants in the conifer stand seems to be in agreement with research done by Kaye and Kirkland (1994). Their results indicate that *Cimcifuga elata* appears to be a shade-tolerant herb but it also appears to respond favorably to additional sunlight. According to Kaye and Kirkland, populations of *Cimcifuga* elata in old growth forests and second growth stands tend to have smaller plants and a lower proportion of reproductive individuals than managed sites, such as thinned stands, clearcuts, or boundaries between cut and uncut stands. At this time, the short-term effect of timber harvest on *Cimcifuga elata* appears to be positive, but population viability in the long-term, after regrowth of conifers shades the forest floor and competes for resources, may be low. In addition, clearcuts pose risks associated with disturbing the forest floor and upper soil horizons that may be harmful to some *Cimcifuga elata* populations. Therefore clearcuts may not be the most effective means to improve conditions for the species. Apparently, the population dynamics of *Cimcifuga elata* in clearcuts are more volatile than in other areas. Habitat management techniques that lead to canopy thinning with minimal disturbance of the forest floor may be optimal.

Cimcifuga elata: This species occurs in moist areas in coniferous forests. There is one known occurrence within the proposed harvest units, T38S, R3E, SEC 29.

Northwest Forest Plan Species

All of the proposed activity areas were surveyed for the presence of Survey and Manage fungi, lichens, and bryophytes in the spring and fall of 1998 and in the spring and fall of 2000, in accordance with established protocols. Surveys documented 53 occurrences for two species.

Species	Status	Occurrences
Bondarzewia mesenterica	1B, BTO	3
Pithya vulgaris	1D	50

Bondarzewia mesenterica: This species occurs in early mature (150yrs) to old growth (300yrs +) conifer stands with at least some canopy closure. It is most frequently observed in the white fir zone or the ecotone between the white fir and mixed conifer zone. On the Medford BLM District it has been observed growing at the base of white fir, sugar pine, and ponderosa pine, stumps. The occurrences within T38S, R3E, SEC's 7, 27, and 29 would be buffered with 100 ft radius buffers in accordance with district protocol established by Medford BLM District Office Instruction Memorandum OR110-2000-8 dated 23, June, 2000.

Pithya vulgaris: This species is restricted to fruiting from detached twigs and down foliage of white fir, Abies concolor, and seldom occurs in stands less than 50 years of age. The occurrences within T38S, R3E, SEC's 9, 10, 11, 12, 15, 17, 18, 19, 21, 22, 27 and 29 would be buffered with 100 ft radius buffers in accordance with district protocol established by Medford BLM District Office Instruction Memorandum OR110-2000-8 dated

23, June, 2000.

3. Noxious Weeds

There are at least 200 non-native plant species established in the watershed. Probably half of these are on the valley floor and in the low foothills where human disturbance has been most intense and climate is most favorable for the invaders. In these areas, the majority of the biomass of herbaceous vegetation is composed of non-native species. They are also abundant and often dominant in moist meadows at higher elevations and other disturbed open areas where seeding has occurred in the past.

Noxious weeds designated by the Oregon Dept. of Agriculture (ODA) are divided into three groups: "T' (target list which are highest priority for control), "A" (second highest priority for control), and "B" (third highest priority for control). A 1997 noxious weed inventory in the Little Butte Creek Watershed identified six noxious weed species: yellow starthistle ("T"), rush skeleton weed ('T'), Canada thistle ("A"), Scotch broom ("B"), spotted knapweed ("B"), and diffuse knapweed ("B"). Range monitoring in 1996 identified four additional noxious weed species in the watershed: leafy spurge ("T"), purple loosestrife ("A"), St. Johnswort (Klamath weed) ("B"), and medusahead rye ("B"). Other noxious weeds that are known to occur in the surrounding area and have potential to spread to Little Butte Watershed are: squarrose knapweed ("T"), tansy ragwort ("T"), French broom ("B"), Italian thistle ("B"), meadow knapweed ("B"), and Russian knapweed ("B").

Five unwanted species that have not been designated as noxious weeds by the ODA have also been seen in the Little Butte Creek Watershed: ripgut brome, hedgehog dogtail, dodder, Spanish broom, and common skeleton weed.

Cirsium vulgare and *Cirsium arvense* are present within the project area and can out-compete the native flora, and rare plants, for water, light, and space. Both of these species occupy open disturbed areas that may be increased through logging activities. Additional openings on the forest floor provide ideal habitat for colonization and skidding logs through existing weed populations spreads weed seeds throughout the area.

B. WILDLIFE

The project area encompasses a broad elevation range and is primarily composed of the following natural plant communities (generally in order of low to high elevation): grass, forbs, herbaceous; shrubs; hardwood/woodlands; and coniferous forests.

These plant communities and the associated condition classes provide habitat for approximately 200 terrestrial wildlife species that are known or suspected to inhabit the watershed. The following table lists the various vegetative condition classes/habitat types and the wildlife species that are representative of each habitat type:

Condition Class	Representative Species
Grass, forbs, herbaceous	Gopher snake, western meadowlark, California ground squirrel
Shrubs	Western fence lizard, wrentit, dusky-footed woodrat
Hardwood/woodlands	Ringneck snake, acorn woodpecker, western gray squirrel

Condition Class	Representative Species
Seedling/sapling	Northwestern garter snake, mountain quail, pocket gopher
Pole (5-11" DBH)	Southern alligator lizard, golden-crowned kinglet, porcupine
Large pole (11-21" DBH)	Ensatina, Steller's jay, mountain lion
Mature/old-growth (21+" DBH)	Northern spotted owl, northern flying squirrel

Retention of Habitat Diversity

Although wildlife species richness is high, elements of habitat decline are present. A gradual loss of habitats such as oak savannahs, meadows, and brushfields has resulted from the exclusion of fire from the landscape. Grassy meadow habitat is less productive as wildlife habitat due to damage from cattle grazing and the encroachment of undesirable noxious weeds.

Most of the current early/seedling-sapling and pole habitat is the result of past timber harvest. Consequently, snags and coarse woody material are often lacking in these areas. Populations of species requiring snags and large coarse woody material have likely declined in these condition classes, while populations of species not requiring these components and associated with open areas and small trees have likely increased. Early successional species such as deer and elk have benefitted from the increased forage base. This can be seen by the increase in size of the elk herd in and around the Little Butte Creek watershed. In the early 1970s, the herd consisted of about 30 to 50 animals. Currently the herd is estimated at over 400 (Thiebes 1996).

In the coniferous plant communities, snag density and down woody material is inadequate in much of the early seral and pole condition classes due primarily to past timber harvest. Fire suppression has contributed to some pole and mature conifer stands becoming more dense than they would have under natural fire regimes. The lack of intrastand structure in these stands generally results in lower species richness in comparison to other condition classes. The abundance of mature/old-growth habitat has declined due to past timber harvest.

Some species have been adversely affected by a general decline in their habitat within the watershed from historical levels. Loss or modification of habitat is probably most pronounced in the mature/old-growth condition class, and wildlife species associated with this habitat have likely been the most affected. The volume of logging in the watershed steadily increased from the 1950s through the 1980s with clearcutting as a predominant method of harvest (Little Butte Creek Watershed Analysis, 1997). Mature/old-growth forests were historically prominent on the wetter, northern aspects of the watershed.

Although supportive data are unavailable, the general decline in habitat condition probably has not resulted in a significant decrease in the number of wildlife species present. However, there has likely been substantial change in wildlife species abundance and distribution.

Connectivity

Connectivity refers to landscape-scale, interconnected forest areas that provide continuous forest habitat for wildlife species movement. Some of the species dependent on connectivity include special status species, game species, and invertebrates. This movement of individuals in the short term is essential to the movement of

genetic material and the prevention of genetic isolation in the long term. Many forest species either cannot, or are reluctant to, move through large openings.

Within the project area itself, connectivity is provided through an extensive riparian reserve system and six one-hundred acre great gray owl nest core reserves. These reserves provide internal travel corridors and habitat areas within the project area and connectivity to the larger landscape outside of the project area.

Landscape

An overview of the larger scale landscape of which the Conde Shell project is a part, reveals that the project area has a large Late Successional Reserve (LSR) to the northeast, consisting of 52,980 acres in the adjoining Rogue River and Winema National Forests. The LSR provides a connectivity link between the project area and other late successional forests. Forty-eight percent of the Little Butte Creek 5th field watershed is under federal ownership. The majority of private land in the area is to the southwest of the project. There are several sections of private industrial timber land within the project area and in the surrounding landscape.

Threatened/Endangered Species

There are no known northern spotted owl nest sites or nest core areas within the project area. There is a potential for this species, which is listed as threatened under the Endangered Species Act (ESA) of 1973, as amended, to be present in the project area. There is also potential for the presence of bald eagles, listed as threatened under the ESA.

The Conde Shell project area encompasses approximately 2,040 acres of suitable northern spotted owl habitat on BLM managed lands. This is 41 percent of the forest capable acres. Suitable habitat is defined as habitat which provides for nesting, roosting or foraging (NRF), and dispersal. Suitable habitat generally has the following attributes: high degree of canopy closure (approx. 60%+), multilayered canopy, presence of large snags, and coarse woody debris.

In addition to the suitable habitat, approximately 1,370 acres within the Conde Shell project area provide spotted owl dispersal habitat. Dispersal habitat affords spotted owls some degree of protection from predators during dispersal, and may be used for foraging on a limited basis, but does not function as NRF habitat. Dispersal habitat consists of conifer stands in the large pole and mature/old-growth condition classes with 40-60 percent canopy closure.

Special Status Species

Species are recognized as "special status" if they are federally listed as Threatened or Endangered, proposed or a candidate for federal listing as Threatened or Endangered, or if they are a BLM sensitive or assessment species. BLM policy is to manage for the conservation of these species and their habitat so as not to contribute to the need to list and to recover these species. Twenty special status wildlife species are known or suspected to be present in the Conde Shell project area. The following table lists these species, their status, and the primary reason they are listed as special status species.

Special Status Wildlife Species

Species	Status[1]	Primary Reason(s) for Status
Western Pond Turtle (*Clemmys marmaorata*)	BS	Habitat loss/degradation, predation

Species	Status[1]	Primary Reason(s) for Status
California Mountain Kingsnake (*Lampropeltis zonata*)	BA	General rarity
Common Kingsnake (*Lampropeltis getultus*)	BA	General rarity
Northern Spotted Owl (*Strix occidentalis caurina*)	T	Timber harvest
Bald Eagle (*Hailaeetus leucocephalus*)	T	Shooting, pesticides, disturbance
Northern Goshawk (*Accipiter gentilis*)	BS	Timber harvest
Great Gray Owl (*Strix nebulosa*)	BS/PB	Timber harvest
Flammulated Owl (*Otus flammeolus*)	BA	Timber harvest
Northern Saw-whet Owl (*Aegolius acadicus*)	BA	Timber harvest
Pileated Woodpecker (Dryocopus pileatus)	BA	Timber harvest
Lewis' Woodpecker (*Asyndesmus lewis)*	BA	Fire suppression, conifer encroachment of oak woodland habitat
Western Meadowlark (*Sturnella neglecta*)	BA	Development (residential and commercial)
Western Bluebird (*Sialia mexicana*)	BA	Development
Townsend's Big-eared Bat (*Plecotus townsendii*)	BS/PB	General rarity, lack of information
Fringed Myotis (*Myotis thysanodes*)	BS/PB	General rarity, lack of information
Long-eared Myotis (*Myotis evotis*)	BS/PB	General rarity, lack of information, timber harvest
Yuma Myotis (*Yuma myotis*)	BS	General rarity, lack of information

Species	Status[1]	Primary Reason(s) for Status
Long-legged Myotis (*Myotis volans*)	BS/PB	General rarity, lack of information, timber harvest
Pacific Pallid Bat (*Antrozous pallidus)*	BS/PB	General rarity, lack of information
Silver-haired Bat *(Lasionyeteris noctivagans)*	PB	General rarity, lack of information

1/ Status:
T - Listed as threatened under the ESA
E - Listed as endangered under the ESA
BS - Bureau sensitive
BA - Bureau assessment
PB - Designated to receive protection buffers in the NFP

Most of these species have been identified in the watershed or on immediately surrounding lands. No systematic surveys have been conducted for the avian species. Cameras have been placed in limited locations for verification of marten and fisher occurrence. To date, only marten have been verified; reliable anecdotal information also places fishers within the Little Butte Creek watershed within the past 20 years.

Survey and Manage Species
The Northwest Forest Plan provides extra protection for some wildlife species through a Survey and Manage standard and guideline. This standard and guideline provides protection for known sites, and directs that surveys be implemented before ground-disturbing activities. As a result of meeting the wildlife criteria, the project area is being surveyed for mollusks, and great gray owls.
Under the NWFP, red tree vole and Siskiyou mountains salamander surveys are not required in this project because it is outside the known and suspected geographic ranges of these species.

Great gray owl
Nesting habitat for this species is typically mature/old-growth forest which is adjacent to meadows or clear-cuts used for foraging habitat. To date, six great gray owl nest sites have been located in the Conde Shell project. They would each receive approximately 100 acre no-treatment buffers, in accordance with ROD and RMP guidelines.

Mollusks
A Survey and Manage snail, *Monadenia chaceana*, has been found in the project area. The Management Recommendations for Survey and Manage Terrestrial Mollusks, version 2.0, dated, Oct., 1999 would be implemented in this project in order to maintain microsite conditions and protect mollusk populations. Documentation of the mollusk protection plan designed for the Conde Shell project is available at the Medford BLM Office.

C. AQUATIC/RIPARIAN
Fisheries
South Fork of Little Butte Creek is a Tier 1 key watershed contributing to the conservation of at-risk

anadromous and resident fish species. Key watersheds are crucial to maintaining and recovering habitat for these at-risk species. Of the anadromous fish species in the South Fork of Little Butte Creek, Southern Oregon/Northern California (SONC) coho salmon (*O. kisutch*) are listed as threatened under the Endangered Species Act (ESA), Klamath Mountain Province (KMP) Steelhead (*O. mykiss*), and coastal cutthroat trout (*O. clarki clarki*) are candidate species. Pacific lamprey *(lampetra tridentata*) are also known to occur in this system but their populations are not well documented or understood[1]. Other native fish species residing in the South Fork of Little Butte Creek watershed not listed under the ESA include: rainbow trout (*O. mykiss*), cutthroat trout (*O. clarki*), Klamath smallscale sucker (*Catostomus rimiculus*), and reticulate sculpin (*Cottus perplexus*).

The Talent Irrigation District (TID) diversion canals in Upper Little Butte Creek Watershed have allowed Klamath speckled dace to access and become established in the Little Butte Creek system[2]. Other introduced fish such as redside shiners, Eastern brook trout, several warm-water species, and the bullfrog compete with resident fish for available habitat and cause further loss through predation. Various non-native warmwater species reside in farm ponds on private lands.

Soda Creek, a tributary to South Fork of Little Butte, supports populations of KMP steelhead (*O. mykiss*), coastal cutthroat trout (*O. clarki*), resident rainbow trout (*O. mykiss*), and sculpin (*Cottus spp.*). Distribution of these fish throughout the Soda Creek drainage has been verified in surveys completed by BLM[3] and ODFW[4]. Resident rainbow and cutthroat trout have been identified in both forks of Soda Creek (see Map 1). Impassable culverts restrict upstream movement of fish and other aquatic species throughout much of the west fork drainage of Soda Creek.

Habitat for other aquatic organisms such as Pacific giant salamanders (*Dicamptadon tenebrosus*), yellow legged frogs (*Rana boylii*), and aquatic garter snakes (*Thamnophis couchi*), may extend well beyond what is suitable habitat for salmonids though survey data for those species is lacking.

Fish Habitat

In general, our native fish and other aquatic organisms need clean, cool water with cover, spawning gravel, and food to survive. Riparian vegetation plays an important role in maintaining healthy habitat for aquatic organisms. Large wood creates habitat for salmonids by providing cover from predators, refugia from current, and by creating pools. The water that flows through these systems must be of cool temperatures to support cold water fish such as salmon and trout. Gravel, free of oxygen-choking sediments is a necessity for spawning fish.

Multistoried riparian vegetation benefits the stream in many ways. Shrubs and low hanging vegetation provide cover from predators while large trees contribute wood to the stream channel. Vegetation keeps stream

[1] U.S.D.A. Forest Service and U.S.D.I. Bureau of Land Management. 1997. South Fork Little Butte Watershed Analysis. Version 1.2.

[2] Ibid # 1.

[3] Bureau of Land Management. 1999. Presence/Absence Surveys: Soda Creek Survey Data.

[4] Oregon Department of Fish and Wildlife. 1994. Aquatic Inventories Project: Soda Creek Survey Data.

temperatures cool by shading the stream from solar radiation. These trees and shrubs also contribute nutrients to the system as coarse organic material that is crucial to the macroinvertebrate communities that support fish and other aquatic organisms.

Large wood has been identified as a limiting factor in Dead Indian and Conde Creek systems.[5] The effects of large wood on stream form and function are positive, creating pools, trapping sediment, providing cover for fish and other aquatic species, and stabilizing banks during high flow events. Beaver have historically contributed wood in the form of beaver dams, to these systems. Beaver dams are present in the upper section of Dead Indian but absent in Conde Creek. Two dams were observed on Dead Indian Creek, below the confluence with Conde Creek.[6]

South Fork of Little Butte Creek and tributaries have been identified by Department of Environmental Quality (DEQ) (1994) as water quality limited under Section 303(d) of the Clean Water Act. From the mouth to Beaver Dam Creek, South Fork of Little Butte Creek is water quality limited due to flow modification, habitat modification, sediment, and summer temperature. Dead Indian and Conde Creeks are limited by summer high temperatures, exceeding the maximum 7-day average for temperature (>64 F). Temperature monitors placed throughout Conde Creek and upper Dead Indian Creek during the summer of 1998 found water temperatures ranging from 65 - 77 F in late July.[7]

The geology of an area plays an important role in describing fish habitat through the physical processes driving a system. South Fork of Little Butte Creek and the Dead Indian and Conde Creek drainages are part of the West Cascades Subprovince. The lower portion of the Dead Indian Creek is deeply dissected with steep side slopes and has a well-developed dendritic drainage patterns in response to landsliding and surface erosion.[8] Geology of the area suggests moderate to high erosion potential and is subject to landslides triggered by storm events and management activities that have compromised the integrity of these side slopes. Effects of the 1997 flood are evident throughout this drainage with remnant landslides, slumps, and scour visible in many fingers of the drainage.

Both upper Dead Indian and Conde Creeks are located on the Dead Indian plateau, a lava plateau terrain formed by geologically recent volcanic eruptions. It is characterized by gentle landforms and smooth topography. Rock outcrops are common in the lava plateau terrain, especially along ridges.[9] The upper sections of Conde and Dead Indian Creeks are comprised of small meandering streams reflecting the flatter headwater topography and wider floodplains.

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[5] U.S. Department of Interior, Bureau of Land Management. 1998. Riparian Surveys: Dead Indian Creek Watershed.

[6] Ibid #3.

[7] U.S.D.I. Bureau of Land Management. 1998. Temperature monitoring study: South Fork Little Butte Creek watershed.

[8] Ibid #2.

[9] Ibid #2.

In the recent past, timber harvest, road building, fire exclusion, removing large wood from riparian areas, and grazing have greatly affected riparian areas and fish habitat. The combined effect of these activities has created a stream with less large wood, fewer pools, increased sedimentation and warmer temperatures.

Surveys conducted by BLM riparian crews in 1995 indicated many areas within Conde and Dead Indian Creeks were in "properly functioning condition", while others were considered to be "functioning at risk" and "non-functioning" (Table 1). Non functioning stream segments were actively eroding or downcutting, and springs and wet areas were being negatively impacted. These conditions were associated with timber harvest, grazing, and roads.

Table 1. Functioning condition of streams within Conde Shell Project Area.

	Functioning Condition				
	PFC	FARU	FARD	NF	Total
Miles surveyed within Conde Shell	4.5	3.8	4.3	1.4	14.0
% of total miles surveyed	32	27	31	10	100

PFC - properly functioning condition, FARU - functioning at risk: upward trend, FARD - functioning at risk: downward trend, NF - not functioning.

Riparian Reserves

Standard widths for Riparian Reserves are provided in the ROD.[10] These widths have been adopted for streams in Conde and Dead Indian Creek watersheds. Reserve widths correspond to stream type: the table below (Table 2) identifies miles of stream within each stream type.

Riparian Reserves in this area fall within the mixed conifer/white fir zone.[11] Conifers dominate the riparian areas along some sections including: Douglas fir, white fir, incense cedar, Pacific yew wood, and some Ponderosa pine. The hardwood component includes big leaf maple, red alder, and some aspen with a limited small shrub component.

Table 2. Stream miles within the Conde Shell Project Area.

	Fish bearing	Non-fish bearing			
		Perennial	Intermittent	Dry draw	Total
Conde Shell project area (BLM only)	2.38	5.03	11.79	12.44	31.64
Conde Shell project area (BLM, USFS, and private)	11.76	11.30	32.3	25.15	91.27

[10] Ibid # 1.

[11] Ibid #1.

Human impacts within the riparian reserves can be seen throughout the Conde and Dead Indian Creek drainages. Past activities included timber harvest, road building, diversion dams, and grazing. Removing wood from riparian areas for commercial use, firewood, or to clean the stream of obstructions also occurred in the past. Clearcuts down into riparian areas have removed the large wood component along the stream and its tributaries in several areas throughout the drainage. The Dead Indian plateau is now drier during the summer months, due to previous harvest activities and various post timber sale treatments. This has resulted in large openings and reduced canopy closure.[12]

Unimproved spur roads dissect the landscape altering riparian reserves by restricting stream meander, cut banks, culverts, and fill material. Winter off highway vehicle (OHV) driving on these spurs can contribute additional sediment to the streams. Roads and associated culverts can cause erosion and sedimentation if not properly maintained or installed. Improperly installed culverts are also migration barriers for fish and other aquatic organisms. Several culverts have been identified for replacement on Conde and Dead Indian Creeks and are listed in Chapter 2.

Diversion dams on Dead Indian and Conde Creeks are barriers to fish migration. Besides creating barriers to migration, ditches remove large volumes of water from the stream and the ditch intakes are not screened. Unscreened intakes allow fish to pass from Howard Prairie to Conde and Dead Indian Creeks, and the reverse is also true.

The headwaters of Dead Indian and Conde Creeks have been grazed for over 100 years. These high meadows are sensitive to animal damage. Current grazing practices on public land encourage increased movement throughout the allotment to reduce impacts.[13] Monitoring programs are in place to document rangeland and riparian condition trends.

D. RANGE

The Keene Creek, Conde, Poole Hill, Deer Creek (Reno Lease), and Deadwood allotments are located within the project area. Livestock grazing preference is for 3331 A.U.M.'s from 5/1 to 9/30. The season of use and livestock preference varies by allotment.

High elevation meadows are popular loafing areas for cattle and elk because of their easy access and proximity to water, food, and shade. Elk frequent many of these high elevation meadows. Approximately 120 head of elk were observed in Conde Creek Meadow during the spring of 1999.

Current livestock grazing practices encourage increased movement throughout the allotment to reduce negative impacts. Monitoring programs are in place to document trends on range land and as a tool for range management. Current management practices are based on this monitoring with the objective of meeting rangeland health standards and maintaining trend in a stable or upward condition. Currently trend on the allotments within the planning area is stable to upward based on established nested frequency plot data. Riparian photo points and greenline surveys have been established throughout the area. A Coordinated Resource Management Plan (CRMP) is currently in place for the Deadwood Allotment.

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[12] Ibid #1.

[13] Tom Jacobs. Personal communication. 1999.

E. LAND USE AUTHORIZATIONS - MINING/RIGHTS-OF-WAY
No mining claims have been identified in the project area.

1. T38S,R2E, Section 13 (OR54620) Peter and Jenny Clark, R/W Road, Shale City.
2. T38S,R3E, Section 9 (ORE06714) Bureau of Reclamation/Talent Irrigation Dist., R/W.
3. T38S,R3E, Section 11 (OR13931) Jackson Co., R/W for Dead Indian Mem Rd., RS 2477.
4. T38S,R3E, Section 11 (OR35917) US West, R/W Phone Line.
5. T38S,R3E, Section 11 (OR50394) PGT, R/W for buried gas line.
6. T38S,R3E, Section 11 (OR52269) US West, R/W for buried fiber optics.
7. T38S,R3E, Section 12 (OR13931, OR35917, OR50394, OR52269) See Section 11.
8. T38S,R3E, Section 15 (ORE06714,OR50394, OR52269) See Section 9 & 11.
9. T38S,R3E, Section 17 (OR13931, OR50394, OR52269) See Section 11.
10 T38S,R3E, Section 18 (OR54620) See Section 13.
11. T38S,R3E, Section 19 (OR13931, OR50394, OR52269, OR54620) See Section 11 & 13.
12. T38S,R3E, Section 19 (OR 23471) PP&L, R/W for electrical line.
13. T38S,R3E, Section 21 (OR13931) See Section 11.
14. T38S,R3E, Section 23 (OR35917) See Section 11. (ORE06530) Bureau of Reclamation/TID, reservation for Howard Prairie Reservoir.
15. T38S,R3E, Section 30 (OR13931) See Section 11.
16. T38S,R3E, Section 32 (OR43253) James Miller,R/W for water line and spring development, RS 2339.

F. RECREATION
Recreation in the project area consists of hunting, camping, fishing, sightseeing, mushroom gathering, snowmobile use, cross-country skiing, driving for pleasure, horseback riding, Christmas tree cutting and firewood gathering. The area includes part of the Hyatt - Howard Special Recreation Management Area (SRMA) which includes the slopes around Hyatt and Howard Prairie Reservoirs as seen from the lakes and facilities around them. The Buck Prairie cross- country ski trails are located on the slopes of Table Mountain extending from Camper's Cove at Hyatt Lake north to the Dead Indian Memorial Highway. A portion of the designated snowmobile trail system is also in this area. The southern 2 miles of the Conde Creek road, 38-3E-17 is also used in mid-July for a permitted sports car event.

The portions of the Buck Prairie Road and surrounding forest lands which are used for cross-country skiing receive heavy use during the months of November through April, depending on the presence of snow. These same areas also receive heavy snowmobile use.

Visual
The portions of the sale area which are located in T38S. R. 3 E. Secs 15,17,and21 plus all units south of the Dead Indian Memorial Road are within the Hyatt - Howard SRMA and these are to be managed under VRM class II objectives which state that management activities should be substantially unnoticeable and should not attract the attention of the casual observer. The remaining portions of the sale which are north of the Dead Indian Memorial road are within VRM class III lands. The objectives for VRM class III state that management activities can attract attention but should not dominate the view.

Cultural
The project area was used extensively by Indians from the Rogue Valley, northern California and the Klamath Falls area during the spring, summer, and fall months to gather food, escape the heat of the valleys,

and to trade with other tribes.

The project area was surveyed under contract by Stepp Consulting during the 1999 field season. Numerous sites were recorded and checked by Resource Area personnel. Known sites would receive a buffer adequate to protect them and a meeting with members of the Shasta Tribe was held in March of 2001 to confirm the presence of sites and to discuss these protection buffers.

G. SOILS AND WATER

The Conde-Shell project area lies within the Little Butte Creek 5th Field Watershed. This watershed includes all the lands which provide runoff draining into Little Butte Creek and its tributaries. The Little Butte Creek Watershed is divided into smaller sub-watersheds, which are further divided into drainage areas. The South Fork and North Fork of Little Butte Creek have been identified as a Tier 1 Key Watershed. Key watersheds are crucial for maintaining and recovering habitat for at risk fish species. This analysis would focus on the current conditions of the individual drainage areas within the Conde-Shell project area. The impact management actions would have on these drainage areas, the key watershed, and the larger 5th Field watershed would be discussed in Chapter 4.

The Conde-Shell project area lies entirely within the Dead Indian Creek Subwatershed. This subwatershed includes all the lands which provide runoff draining into Dead Indian Creek and its tributaries. It is part of the South Fork of Little Butte Creek Key Watershed.

The Conde-Shell project area contains four complete drainage areas, and part of one other drainage area. The five drainage areas are described below:

1) LB 0509 Dead Indian Creek: includes all lands which provide runoff draining into Dead Indian Creek from its headwaters down to the Conde/Dead Indian Canal diversion. This drainage area contains 33.3 miles of stream, of which 21.1 miles are perennial/intermittent and 12.2 miles are ephemeral/dry draw. All of this drainage area is within the Conde-Shell project area.

2) LB 0512 Dead Indian Creek: includes all lands which provide runoff draining into Dead Indian Creek from below the Conde/Dead Indian Canal diversion to above its confluence with Conde Creek. This drainage area contains 8.7 miles of stream, of which 6.3 miles are perennial/intermittent and 2.4 miles are ephemeral/dry draw. All of this drainage area is within the Conde-Shell project area.

3) LB 0515 Conde Creek: includes all lands which provide runoff draining into Conde Creek from its headwaters down to the Conde/Dead Indian Canal diversion. This drainage area contains 19.9 miles of stream, of which 8.4 miles are perennial/intermittent and 11.5 miles are ephemeral/dry draw. All of this drainage area is within the Conde-Shell project area.

4) LB 0518 Conde Creek: includes all lands which provide runoff draining into Conde Creek from below the Conde/Dead Indian Canal diversion to above its confluence with Dead Indian Creek. This drainage area contains 12.8 miles of stream, of which 8.8 miles are perennial/intermittent and 4.0 miles are ephemeral/dry draw. All of this drainage area is within the Conde-Shell project area.

5) LB 0521 Dead Indian Creek: includes all lands which provide runoff draining into Dead Indian Creek from below its confluence with Conde Creek to above its confluence with the South Fork of Little Butte

Creek. Only a small potion in the upper part of this drainage area is within the Conde-Shell Project Area. This portion contains 4.7 miles of stream, of which 3.1 miles are perennial/intermittent and 1.6 miles are ephemeral/dry draw.

Drainage Area Data*

Drainage Area (DA)	Total Area (Acres)	% of DA within the project area	% of DA affected by proposed action	% of project area within Transient Snow Zone	Road Density miles/ sq. mile	# of road stream crossings within the project area
LB 0509	5031	100	20	47	4.7	76
LB 0512	1036	100	16	6	3.7	15
LB 0515	2622	100	9	55	4.5	71
LB 0518	1479	100	20	0	3.0	11
LB 0521	4062	22	5	0	2.3	4

* GIS Data - Total area, road density, and stream crossings include public and private lands.

Water Quality

Conde Creek and Dead Indian Creek have been identified by the Oregon Department of Environmental Quality (ODEQ) as water quality limited under Section 303(d) of the Clean Water Act. From the mouth to headwaters, Conde Creek and Dead Indian Creek are water quality limited due to summer temperature exceeding the maximum 7-day average (>64° F). Temperature monitors placed in four locations of Conde Creek during the summer of 1999 found 7-day maximum average water temperatures ranging from 69.1 - 73.1° F. One monitor placed in Dead Indian Creek above Conde Creek in 1999 recorded a maximum 7-day average of 74.8° F. In all cases the average maximum temperature occurred during the month of July.

Streamflow Regime

The project area is characterized by cold, snowy winters and hot, dry summers. Average annual precipitation ranges from approximately 44 inches at the lower elevations to 52 inches at the higher elevations. Winter precipitation usually occurs as snow, which normally melts between April and June. Streamflow in the Little Butte Creek Watershed fluctuates with seasonal variation of precipitation. Moderate to high flows generally occur from mid-November through May. Streamflows during the months of April and May and part of June are augmented by melting snowpack in the high elevations. The South Fork of Little Butte Creek and its tributaries normally experience low flows which coincide with the period of low precipitation from July through September, and maximum peak flows generally occur in December. (LBWA 1997)

High flows are often the result of rain-on-snow storm events that occur when a substantial amount of rain falls on snow accumulated in the transient snow zone (elevation zone of 3,500 to 5,000 feet). The snow level in this zone fluctuates throughout the winter in response to alternating warm and cold fronts. The

combination of heavy rain and rapid snowmelt can result in flooding. The transient snow zone occupies 31% of the Little Butte Creek Watershed, 47% of the South Fork Little Butte Subwatershed (LBWA 1997), and 35% of the Conde-Shell Project Area (GIS Data).

Upland disturbances can increase the magnitude and frequency of peak flows. This may result in accelerated streambank erosion, channel widening, scouring and deposition of stream beds, landslides, and increased sediment transport. These are normal occurrences in a naturally functioning stream system. However, increases in peak flows due to human caused factors can greatly magnify the effects. For the Conde-Shell Project Area, the primary human caused disturbances which can potentially affect the timing and magnitude of peak flows include roads, soil compaction, and vegetation removal.

Roads collect surface water runoff and intercept subsurface water. This water is quickly transported from the roads to streams. A road-altered stream network may cause peak flows to increase in magnitude and change the timing of runoff entering the streams. This is more pronounced in areas with high road densities and where roads are in close proximity to streams. GIS data shows about 70 miles of road within the project area with 177 stream crossings. The road density for the entire project area is 4.1 miles of road per square mile. A road density greater than 4.0 miles per square mile is considered high.

Road Data*

Analysis Area	Total Road Miles	Road Density Miles/Sq. Mile	Stream Crossings #
5th Field Watershed	1114.3	3.0	2486
Key Watershed	636.7	3.2	1247
Conde-Shell	72.0	4.1	177

* GIS Data - Includes public and private lands.

Soil compaction caused by roads, timber harvest activities, and grazing affects the hydrologic efficiency within a watershed by reducing infiltration rates and causes more precipitation to quickly enter streams as runoff instead of slowly percolating through the soil to the streams. Soil compaction data has not been collected for the Little Butte Creek Watershed.

Vegetation removal reduces interception which allows more precipitation to reach the soil surface and infiltrate or become runoff. The increased runoff and soil moisture can increase peak stream flows. Large areas of vegetation removal in the transient snow zone may result in an increase in snowpack accumulation which can quickly melt during a rain-on-snow event and may result in extremely high streamflows. Once vegetation is removed, it is considered to be hydrologically unrecovered until new vegetation obtains the same crown closure as the previous unmanaged stand. According to the Little Butte Creek Watershed Analysis, Douglas-fir and white fir stands are considered to be 100 percent hydrologically recovered when they obtain a crown closure of 70 percent, and pine stands are fully recovered at about 40 percent. These canopy closure percentages reflect reference conditions when natural disturbances were more frequent. The

range of natural variability includes canopy closures that would be greater than and less than full hydrologic recovery.

The hydrologic recovery of the Conde-Shell area is shown below. This data was calculated by applying recovery factors to the vegetation information derived from Western Oregon Digital Image Processing satellite imagery data. This analysis is similar to that done in the Little Butte Creek Watershed Analysis. The satellite imagery data is only available in 10 percent increments, starting at 5 percent, so full recovery had to be taken at 75% instead of 70%. The satellite data does not have the capability of distinguishing between tree series so pine stands had to be treated the same as Douglas-fir. Therefore, the percent hydrologic recovery shown below is a conservative estimate. Areas classified as water, rock, and grassland/shrubland are considered fully recovered for this analysis. Urban/agricultural areas are 0 percent recovered.

Hydrologic Recovery

Analysis Area	Percent of Area Hydrologically Recovered	
	All Lands	Transient Snow Zone
5th Field Watershed	65	75
Key Watershed	73	75
Conde-Shell	59	58

Stream Channel Morphology
The main geomorphic landform within the Conde-Shell project area is the lava plateau. The lava plateau landform is found in the higher elevations, 4400 to 6000 feet, and is fairly smooth and gently sloping. This area is commonly referred to as the Dead Indian Plateau. Lava pateau terrain was formed primarily by geologically recent volcanic eruptions and flows. Rock outcrops are common, especially along ridges. This area has stable slopes with slight to moderate erosion potential (LBWA 1997).

The project area is an intermixed patchwork of coniferous forest and open meadows. Many springs, seeps, and wetlands are scattered throughout the area. There are two major stream systems within the project area. They are Conde Creek and Dead Indian Creek. Stream types within these two systems are predominately Rosgen E type streams flowing through meadows. Rosgen E type streams have very wide, well developed flood plains, very high sinuosity, and are typically very stable. However, historically heavy grazing pressure, past logging, and other management practices within the project area have resulted in a loss of riparian vegetation, bank erosion, and down cutting. All hydrologic features are protected by riparian reserves in this project.

Soils
The soils in the project area formed from material weathered from igneous rock on plateaus and hillslopes. The topography ranges from 3 to 50 percent slopes. The most common soils identified in the project area are Farva, Pinehurst, Woodseye, Sibannac, Bybee-Tatouche Complex, Kanutchan, and Rustler Peak. The Bybee-Tatouche Complex, and Kanutchan soils have montmorillonitic mineralogy which causes these soils to have

high shrink-swell potential and are subject to severe compaction. The Farva, Woodseye, and Rustler Peak soils have high rock content and/or are shallow in depth which limits moisture holding capacity. The Bybee, Kanutchan, and Sibannac soils have perched or apparantly high water tables December through May. The following table lists the soil characteristics of each respective soil series. A map showing the location of these soils on the landscape is on file at the Medford BLM office.

MapUnit #	Soil Series Name	Soil Depth	Surface Texture	Subsoil Texture(s)
56/57/58/59	Farva	20-40"	very cobbly loam	extreamly cobbly loam
142/143/144	Pinehurst	60"+	loam	clay loam
207	Woodseye	<20"	very stoney loam	very cobbly loam
167	Sibannac	60"+	silt loam	clay loam
20	Bybee Tatouche Complex	60"+	loam	clay
96	Kanutchan	40-60"	clay	clay
159/160	Rustler Peak	20-40"	gravelly loam	very cobbly clay

CHAPTER 4
Environmental Consequences

INTRODUCTION
This chapter forms the scientific and analytic basis for comparison of alternatives. Discussions include the environmental impacts of the alternatives and any adverse environmental effects which cannot be avoided should the proposal be implemented. It also identifies and analyzes mitigation measures, if any, which may be taken to avoid or reduce projected impacts.

The impact analysis addresses direct, indirect, and cumulative impacts on all affected resources of the human environment, including critical elements.

A. VEGETATION, DIRECT AND INDIRECT EFFECTS

1. Forestry Proposed Action Alternative, Variable Prescriptions

The prescriptions proposed to be applied across the forest landscape are based upon the present vegetation structure, species composition, aspect, and vegetation condition class. The main objectives are to create old-growth forest stand structure, and to maintain the desired tree series over time. Through forest stand treatments tree densities are reduced thus allowing for improved individual tree vigor and growth, and improved forest health. Table 2 of the silvicultural prescription shows projected 20-year diameter growth for treated and untreated stands (projections from the southwest Oregon ORGANON growth analysis model). Table 4 of the silvicultural prescription shows the growth of one mid seral and one mature stand with and without management. In both unthinned stands hundreds of trees per acre are lost through natural mortality. After the same stands are thinned to specified levels, little natural mortality occurs (See Silvicultural Prescription, Table 3).

The silvicultural prescription (Table 2) esto,ates that 10-year diameter growth would exceed 2.5 inches if the stands are treated as proposed. The remaining trees would be vigorous enough to withstand bark beetle attacks. This is important for retention of old-growth trees in the forest stands.

With the group selection prescription, pine species would be favored for retention to increase their prevalence in the forest stands, and to decrease the infection level of Douglas-fir dwarf mistletoe at the stand level.

The objective of the Douglas-fir dwarf mistletoe prescription is to manage the location of the parasite over a very long period of time. With treatment the rate of infection would most likely decrease with time.

The various prescriptions meet the specifications of restoration thinning and density management as outlined in the Medford District Resource Management Plan.

1. Forestry No Action Alternative

No action would allow forest stands to remain overstocked and individual tree vigor and growth would

remain in decline. Dominant tree 10-year radial growth is 0.70 inches or 1.40 inches diameter growth per decade in the Conde Shell area. Average dominant tree 10-year radial growth ranged from 0.15 to 2.5 inches. When diameter growth is less than 1.0 inch per decade, pine trees cannot pitch-out bark beetles and tree mortality results (Dolph, 1985). Tree mortality represents a reduction in stand volume production and loss of revenue, and poor tree vigor.

Trees with poor vigor ratings may succumb to bark beetle attacks of relatively low intensity (see Chapter 3, for the explanation of Waring's (1980) tree vigor index rating).

Without action, forest structure and species composition could not be regulated. On pine sites, Douglas-fir and white fir would remain the most prevalent species and stands would remain in the stem exclusion stage of development (approximately 30 to 50 years). Old-growth ponderosa pine and Douglas-fir trees with seedlings through poles within their dripline would continue to die from competition for water. Ponderosa and sugar pines would continue to decline in number from competition with Douglas-fir because of their shade intolerance. With large tree mortality, forest stand structure would continue to shift to the understory reinitiation stage.

No action contradicts the Medford District Resource Management Plan and the Little Butte Creek Watershed Analysis forest condition objectives in regard to forest health. The plans state that management emphasis be placed on treatments and harvests that restore stand conditions and ecosystem productivity.

2. Botany Proposed Action Alternative
The Federally listed *Fritillaria gentneri* is not known to occur within the confines of the Conde Shell Timber Sale harvest units and the proposed action would have no affect on the continued persistence of this species within its known range.

The one occurrence of the Bureau Special Status Plant *Cimcifuga elata* would be buffered with a variable radius buffer of 100-150 ft and the 53 occurrences of the Northwest Forest Plan species would be buffered with a 100 ft radius buffer in accordance with Medford BLM District Office Instruction Memorandum OR110-2000-8 dated 23, June, 2000. This buffering provides protection from physical disturbance and microclimate alterations associated with timber harvest activities.

Under the Action Alternative, there would be no direct effects to the *Cimcifuga elata* population. Indirect and cumulative effects would most likely be beneficial to the continued persistence of this species. Selective removal of existing trees would help maintain forest openings and reduce the possibility of an intense ground fire. The only known site within the confines of the Conde Shell Timber Sale harvest units occurs in an open white fir stand. The harvest prescription calls for the retention of 160 sq.ft BA/AC and a crown spacing of 3 to15 feet. This level of tree retention in combination with a 100-150 radius buffer would provide adequate protection for the continued persistence of the species on the site.

The action alternative would have no direct affect on the continued persistence of *Bondarzewia mesenterica or Pithya vulgaris* within the confines of the Conde Shell Timber Sale harvest units. Indirect effects would include a decrease in canopy cover accompanied by an increase in light and a decrease in moisture retention.

All of these species are associated with relatively moist stands and a decrease in moisture retention might be detrimental to their continued persistence on the site. However, selective removal of some trees from the site could help to reduce the accumulation of ground fuels that might result in a stand destroying fire.

Noxious weeds, especially *Cirsium vulgare* and *Cirsium arvense* are present within the project area and can out-compete the native flora, and rare plants, for water, light, and space. Both of these species occupy open disturbed areas that may be increased through logging activities. Additional openings on the forest floor provide ideal habitat for colonization and skidding logs through existing weed populations spreads weed seeds throughout the area. Through time, the indirect affect of noxious weeds in habitat and plant communities containing Bureau Special Status Plants and Survey and Manage Plants would be detrimental.

2.Botany No Action Alternative
The no action alternative would have no direct affect on the continued persistence of *Cimcifuga elata* on the site. Detrimental indirect and cumulative effects might result if natural revegetation of the site is allowed to continue unchecked in the absence of fire. *Cimcifuga elata* requires small openings in the forest canopy which would be eliminated over time if natural successional processes were to occur in the absence of fire. The resulting accumulation of fuels on the forest floor would greatly increase the possibility of an intense ground fire. The loss of light from a closed canopy or an intense ground fire could eliminate the species from this site.

The no action alternative would have no direct affect on the continued persistence of *Bondarzewia mesenterica* or *Pithya vulgaris* within the confines of the Conde Shell Timber Sale harvest units. *Bondarzewia mesenterica* occurs most frequently in early mature (150+ yrs.) to mature (>300 yrs.) white fir and white fir / Douglas fir stands and *Pithya vulgaris* occupies white fir and white fir / Douglas fir stands ranging in age from 50+ yrs. - (>300 yrs.). Detrimental indirect and cumulative effects might result if management activities allow fuel levels to accumulate to the point that a stand destroying fire occurs.

At least two noxious weed species (*Cirsium vulgare* & *Cirsium arvense*) occur within the project area in open disturbed sites. Noxious weeds can out-compte the native flora, and rare plants, for water, light and space. If left un-treated, noxious weeds can reduce habitat suitability for the Bureau Special status plants adapted to those habitats. With the no action alternative, noxious weeds would continue to spread.

B. WILDLIFE, DIRECT AND INDIRECT EFFECTS
THREATENED/ENDANGERED SPECIES, NORTHERN SPOTTED OWL - Proposed Action Alternative
The northern spotted owl is listed as a threatened species under the auspices of the Endangered Species Act of 1973, as amended. There are no known spotted owl nest sites within the Conde Shell project at the present time. Due to habitat modification that would occur under Alternative I, BLM is required to formally consult with the U.S. Fish and Wildlife Service because the proposed actions would adversely affect northern spotted owls.

Alternative I would modify approximately 1,750 acres of suitable northern spotted owl habitat (i.e., nesting/roosting/foraging habitat) and 710 acres of dispersal habitat. Approximately 202 acres of the suitable habitat would be lost as suitable or dispersal habitat. The pine and mistletoe treatments prescribed for these

areas would potentially open the forest canopies below 40 percent. It is expected to provide dispersal habitat again in 10-30 years if it remains unharvested for this period of time.

Approximately 1,340 acres of dispersal habitat to be harvested by the thinning prescriptions would retain dispersal habitat function after the harvest. Approximately 10 acres of dispersal habitat to be cut in mistletoe and pine site prescriptions may be lost as dispersal habitat.

The effects of Alternative I on northern spotted owl habitat are summarized in the following table:

Effects of Alternative I on Northern Spotted Owl Suitable Habitat			
Existing Suitable habitat	**Amount Suitable Treated**	**Remains Suitable Habitat**	**Loss as Suitable or Dispersal Habitat**
2,013 ac	1,750 ac (87%)	1,812 ac (90%)	202 ac (10%)

Effects of Alternative I on Northern Spotted Owl Dispersal Habitat			
Existing Dispersal habitat	**Amount Dispersal Treated**	**Remains Dispersal Habitat**	**Loss of Dispersal Habitat**
1,344 ac	710 ac (52%)	1,340 ac (98%)	10 ac (1%)

The habitat loss described above is expected to adversely affect the ability of spotted owls within and adjacent (within 1.2 miles) to the project area to successfully reproduce. Formal consultation for the northern spotted owl with the U.S. Fish and Wildlife Service (USF&WS), is pending for timber sales in the project area. The consultation process would be completed prior to any management actions that may affect listed or proposed species or habitat found in the project area. May affect projects would meet the mandatory terms and conditions of the USF&WS Biological Opinion issued as a result of consultation.

Northern Spotted Owl Critical Habitat Unit (CHU)

Approximately 344 acres of the Conde Shell project area are in CHU OR-37. The majority of this CHU (80%), is encompassed within the adjacent Dead Indian Late Successional Reserve (LSR) to the northeast of the Conde Shell project within the Rogue River and Winema National Forests. This CHU provides the single most important link connecting the Oregon Cascades Province to the Klamath Mountains Province across the south Ashland portion of the I-5 Area of Concern. By straddling the crest this unit provides an important east-west connectivity for the southern Oregon Cascades. This CHU also provides the only link to the north in the Oregon Cascades, and is the key link from Oregon to California south of Highway 66.

Within the Conde Shell project portion of the CHU, approximately 199 acres provide suitable habitat (nesting/roosting/foraging) for northern spotted owls. Under Alternative I, approximately 46 acres of suitable habitat would be harvested within the CHU using the pine site prescription. The following table shows the effects of Alternative I on northern spotted owl habitat within CHU OR-37:

Effects of Alternative I on Northern Spotted Owl Habitat Within Critical Habitat Unit CHU OR-37			
Existing Suitable Habitat	**Amount Suitable Treated**	**Remains Suitable Habitat**	**Loss of Suitable Habitat**
199 ac	46 ac (23%)	153 ac (77%)	46 ac (23%)

When designated as critical habitat in 1992, the proposed function of CHU OR-37 was to maintain adequate nesting, roosting, and foraging habitat to improve connectivity between other CHUs. In the Biological Opinion for the Northwest Forest Plan, the U.S. Fish and Wildlife Service concluded that the combination of land allocations and prescriptions in the plan should enable the critical habitat network to perform the biological function for which it was designated even though the LSR network did not completely overlay the CHU network. Given this, the apparent primary function of critical habitat outside of LSRs, is to help provide the necessary dispersal/connectivity between LSRs. Under the proposed action alternative the silvicultural prescriptions for mistletoe and pine treatments would potentially render approximately 46 acres (23%) of suitable habitat in the CHU too open for dispersal which would adversely affect the dispersal function of the CHU.

WILDLIFE, SPECIAL STATUS SPECIES - Proposed Action Alternative
The following Special Status Species (SSS) known to be present in the project area and would be affected by the proposed projects: long-legged myotis (BS), fringed myotis (BS), Yuma myotis (BS), western bluebird (BA), pileated woodpecker (BA), and great gray owl (BA).

All species would be affected due to the overall change in stand structure, specifically the reduction in canopy closure and/or snag density in the mixed conifer plant community. All of the species would be affected in their ability to feed, breed, and shelter. The Northwest Forest Plan, however, provides some degree of site specific mitigation for these species through the implementation of appropriate Standards and Guidelines. Impacts to the bat species would be mitigated by the retention of most snags. Impacts to great gray owls would be mitigated by the retention of core areas around nest sites/activity centers. Retention of snags would also mitigate impacts to western bluebirds.

Indirect effects associated with the proposed project, such as site preparation or planting, would have only minor impacts on wildlife because these actions would occur in areas already disturbed by the major actions (i.e., timber harvest treatment).

WILDLIFE, SPECIAL STATUS SPECIES - No Action Alternative
Since no projects are planned under this alternative, disturbances and vegetative succession would occur without the impact from forest management activities (except for fire suppression), and wildlife populations and distributions would change in response to these processes. Exclusion of natural fire regimes across the landscape would continue the trend toward loss of some plant communities within open pine, oak woodlands, grasslands and associated wildlife species. This alternative would continue to facilitate a high fire-hazard.

C. AQUATIC/RIPARIAN, DIRECT AND INDIRECT EFFECTS
The Aquatic Conservation Strategy (ACS) was developed to restore and maintain ecological health of watersheds and aquatic ecosystems on public lands. The strategy would protect salmon, and steelhead habitat on federal

lands managed by the Forest Service and Bureau of Land Management within the range of Pacific Ocean anadromous species. For a detailed analysis of the ACS objectives see Appendix **C**.

1. Threatened and Endangered Fish Proposed Action Alternative

This project is determined to be a "No Effect" because there is a barrier to anadromous migration approximately four (4) miles downstream of the project area. This barrier is therefore considered the end of critical habitat (50 CFR Part 226). None of the activities proposed in this project could impact listed fish or their habitat.

2. Aquatic/Riparian Proposed Action Alternative
Soil compaction and soil disturbance from timber harvest activities sometimes decrease infiltration rates and increase the potential for erosion and sediment movement into streams. According to the hydrologic analysis, soil compaction may result in slight local increase in surface runoff; however, the scattering of units across the landscape should limit the effects of compaction to localized areas. Soil disturbance may result in short-term increases in soil movement along temporary spur roads, skid trails, and on cable yarding corridors. Project design features and best management practices would minimize soil disturbance related to these activities. Most importantly, Riparian Reserves buffer the stream from any effects of soil disturbance by capturing and reducing potential runoff and filtering sediment that may be contained in the runoff.

Blocking, decommissioning, and/or improving road drainage on roads within Riparian Reserves may briefly increase fine sediment input to the system. Best management practices for these activities ensure that soil and streambed disturbances are minimized. Road decommissioning and blocking should reduce road-caused sedimentation over the long term and allow riparian vegetation to recolonize the road surfaces. As trees grow up in the road bed, their roots loosen the compacted soil, restoring groundwater flow, thus improving the humid character of the riparian area. These trees also contribute organic material to the streams, provide shade, and increase potential large wood for eventual instream complexity. Fewer fine sediments would have almost immediate positive impact on aquatic habitat, as current fines are flushed out in spring flows, and sediment sources are eliminated around the basin. Local connectivity would improve slightly where culverts are removed, allowing natural channel response to high water and restoring migration routes for aquatic organisms.

Large wood recruitment would improve over time, as trees in Riparian Reserves mature, die, and fall into the stream. Within sections of Riparian Reserve where small diameter trees dominate, precommercial thinning would encourage trees to attain late-successional characteristics sooner, and in some cases the vegetation would become more structurally diverse.

A slight to moderate increase risk of increased peak flows as a result of rain-on-snow events is anticipated due to decreases in canopy closure within the transient snow zone (See Hydrology Section). Because of relatively flat topography in the project area, these effects are expected to be short-term and of short duration with little impact to aquatic organisms.

Aquatic/Riparian No Action Alternative - Direct and Indirect Effects
In the No Action alternative, silvicultural treatments, road building, and road decommissioning would not take place in Riparian Reserves or in surrounding uplands. Therefore, there would be no direct effects. Indirect effects would continue as current condition trends and cumulative effects brought on by past activities in the

watershed persist. Sediment input and Riparian Reserve problems would remain the same. There would be no change in current condition trends in Riparian Reserves or fish habitat. Over time, large wood recruitment would occur although at a slower rate than if precommercial thinning of certain crowded stands of trees were thinned.

D. FUELS, DIRECT AND INDIRECT EFFECTS - No Action Alternative

The current trend of increasing stand density in the timbered stands would continue. Ladder and surface fuels would also increase within these timbered stands. With increased stand densities and fuel loadings the chance of more acres that would burn in high intensity fires within the Conde Shell project area would increase. Fire fighter safety would continue to be an issue as well as the potential of increased resource damage.

Air quality would be impacted in the event of a large wildfire. Emissions from wildfires are significantly higher than from prescribed burning. The wildfires which occurred in southern Oregon in 1987 emitted as much particulate matter as all the burning that occurred within the state that year.

FUELS, DIRECT AND INDIRECT EFFECTS - Proposed Action

In the short term (10-25 years) logging would create surface fuels which would be greater in most areas than current levels if they are not treated. Fuel amounts are measured in tons per acre for different size material. Material up to 3 inches in diameter has the greatest influence on the rate of spread and flame length of a fire, which has direct impacts on fire suppression efforts. It is anticipated that fuel loadings after logging would be increased by approximately 3-15 tons to the acre. This would change the existing fuel model of some of the timbered stands which in some cases higher rates of spread and greater flame lengths would occur. Direct attack of a fire would be limited under some weather conditions so indirect measures would have to be taken. This would in turn increase the size and cost of a wildfire.

Logging slash, if not treated, would also increase the duration and intensity of a ground fire. This would cause increased mortality to the smaller diameter overstory trees. To mitigate the impacts of residual logging slash on the fuel hazard of the harvest units, fuels would be treated on the majority of the acres harvested under this proposed project.

This alternative would reduce the overall density (aerial fuels), ladder fuels and surface fuels of the timber stands which are proposed for treatment. This in turn would reduce fire behavior such as flame length. By altering fire behavior, the duration of a fire and the amount of acres burned in high intensity fires would be reduced. This change in fire behavior would reduce the mortality of conifers in the event of a wildfire.

Prescribed burning is the only proposed management activity which could have a notable adverse effect on local and downwind air quality. Air quality of local communities could be impacted for brief periods of time due to prescribed burning. Prescribed burning under late fall, winter and early spring conditions consumes less of the larger fuels which creates fewer emissions. Smoke dispersal is easier to achieve due to the general weather conditions that occur at this time of year. The use of aerial ignition (helicopters) reduces the total emissions by accelerating the ignition period and reducing the total combustion process due to the reduction in the smoldering stage.

All burning would be done in accordance with the Oregon Smoke Management Plan which tries to prevent prescribed fire smoke from being carried to or accumulate in designated smoke-sensitive areas. This plan is in

conformance with federal air quality and visibility requirements to protect public health and encourage the reduction of emissions.

E. HYDROLOGY/SOILS, DIRECT AND INDIRECT EFFECTS

Alternative 1 Proposed Action

Soils

Timber harvest has the potential for increasing soil moisture and activating future slumps or landslides. There are some areas with past slumping activity within the planning area. However, slopes in the proposed units are generally stable and the landslide hazard is considered low. Areas of high landslide potential have been avoided.

Soil compaction resulting from timber felling ,yarding, and road building could reduce infiltration rates and increase the potential for erosion and sediment movement into streams. Compaction also reduces soil productivity and causes plants to grow slower than in non-compacted areas. All tree harvesting using tractors would be accomplished using designated skid trails resulting in the compaction of approximately 12 percent or less of the unit. Cable and helicopter yarding would result in less soil disturbance. Mulching, seeding, and placing slash on the skid roads and yarding corridors would help reduce the potential for erosion and sediment movement.

Water Quality

Improperly designed and maintained roads are usually the main cause of stream sedimentation. The project area has a high existing road density. The proposed action would result in a decrease in road density for the Conde-Shell project area from 4.1 to 3.8 miles/sq. mile.

Project Effects on Road Density (miles/sq. mile)

Drainage Area	Before Project	After Project
LB 0509	4.7	4.2
LB 0512	3.7	3.7
LB 0515	4.5	4.3
LB 0518	3.0	2.9
LB 0521	2.3	2.3
Conde-Shell	4.1	3.8
Key Watershed	3.2	3.2
5th Field Watershed	3.0	3.0

About 50 miles of road renovation, maintenance and drainage improvement, as well as log hauling could cause a short term increase in stream sedimentation. Adverse effects would be localized, extending several hundred feet downstream of stream crossings and would only last about one year. Road renovation, maintenance, and drainage improvement is intended to reduce actual and potential erosion, potential road failure, and the resulting stream sedimentation. Sedimentation would either decrease (improve) after the initial flush of sediment is dispersed, or be maintained at its existing level, depending on existing road and stream conditions. Overall, there should be a long term decrease (improvement) in stream sedimentation rates within the project area due to less roads, improved road drainage, and renovated existing roads.

The closing of 22 miles of road with gates and barricades would help reduce sediment input by restricting traffic use on those roads. This is especially important during the winter season when erosion potential and sediment production is highest, and would be greatly increased by road traffic. Therefore, closing these roads would result in a long term decrease in sediment production.

There would be a short term increase in soil movement along temporary spur roads, skid trails, and on cable yarding corridors before disturbed soils stabilize. However, locating temporary roads on or near ridges, decommissioning temporary roads, seeding, mulching, and water barring skid trails, and establishing Riparian Reserves would reduce or prevent sediment from reaching streams.

Conditions within the water quality limited streams should improve. The proposed action would not negatively affect the water quality limited streams due to the implementation of riparian reserves, project design features, and best management practices. The reduction in sediment delivery through road improvements and decommissioning should cause an overall reduction in stream sediment levels. The establishment of Riparian Reserves would protect riparian vegetation which provides stream shading. It is unknown how long it would take

for stream temperatures to return to within the accepted limits.

A discussion about the relationship of the Aquatic Conservation Strategy and the proposed action is in Appendix D.

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Stream Flow Regime

Decommissioning five (5) miles of road would decrease road densities (from 4.1 miles per square mile to 3.8 miles per square mile) for the entire project area. The road density would remain unchanged at the Key Watershed and 5th Field Watershed level. The small change in road densities would have little to no effect on peak flows compared to the current condition.

Soil compaction may result in a slight local increase in surface runoff within individual harvest units. The spatial scattering of harvest units across the landscape should limit the effects of compaction to localized areas. The existence of Riparian Reserves should help to capture and reduce potential runoff and filter any sediment it may be carrying. The resulting peak flows in the stream channels may increase slightly from existing conditions. The affects of increased peak flows would be discussed later in the Channel Morphology section.

Silvicultural treatments would occur on approximately 1900 acres within the project area. About 1200 of these acres are located within the transient snow zone. A variety of silvicultural treatments are planned within the project area and even within harvest units. The resulting canopy closures would be variable across the project area. The table below shows the predicted effects of the project on hydrologic recovery in the transient snow zone.

Project Effects on Hydrologic Recovery

Analysis Area	Percent of Area Hydrologically Recovered in the Transient Snow Zone	
	Before the Project	After the Project
Conde-Shell	57.8	54.6 to 50.0
Key Watershed	75.3	74.9 to 74.4
Little Butte Watershed	74.8	74.5 to 74.1

The prediction is based on the worst case scenario in which canopy closures within the harvest units would be reduced from full hydrologic recovery (70 percent canopy cover or greater) to between 60 and 40 percent. This estimate was done using the same procedure described in Chapter 3. This project would result in a 3 to 8 percent decrease in the total hydrologically recovered area within the transient snow zone at the project level. The Key and 5th Field Watersheds would see a small to slight decrease. Slightly more than half of the transient snow zone within the project area would still be at full recovery. This would cause a slight to moderate increase in risk of a higher magnitude flow event occurring as the result of a rain-on-snow event. The increase in risk of such

an event happening would be temporary; the highest increase in risk being immediately after the treatment, and then gradually reducing as the canopy recovers. The time required for recovery depends on many variables such as stand health and vigor.

The resulting impact within the watershed depends on the condition of the streams. The majority of streams in the project area have the capability of withstanding the energies associated with a high flow event without severe degradation. Stream gradients are very low and many streams have wide floodplains and/or high sinuosity to help dissipate flow energies.

Channel Morphology
Compaction, high road densities, and vegetation removal in the transient snow zone could combine to increase peak flows more than the individual impact of each factor. The exact effect this would have on the stream channels is unknown. However, increased bank cutting, down cutting, channel widening, and increased sediment delivery could occur if extreme increases in peak flow occur. Extreme increases are unlikely due to the spatial scattering of the treatment areas, the use of silvicultural prescriptions which do not create large openings, and the existence of Riparian Reserves.

Alternative 2 No Action - Direct and Indirect Effects
No silvicultural treatments, road building, road decommissioning, road renovating, or stream crossing improvements would take place under this alternative. Therefore, there would be no direct effects.

Indirect effects would be the continuation of current watershed conditions and cumulative effects of past management within the project area. Road densities would remain at the present level. Unimproved roads with inadequate drainage structures would continue to direct increased runoff and sediment into streams.

F. CULTURAL - Proposed Action Alternative
all known sites would be protected and any additional sites discovered during project implementation would be protected. Therefore, there would be no anticipated impacts to the cultural resources.

G. VISUALS/RECREATION - Proposed Action Alternative
The proposed activities in the Hyatt-Howard SRMA are to thin from below and to remove only 3000 to 5000 board feet per acre. No unacceptable visual impacts are anticipated.

The impacts to snowmobile are from the plowing of the roads which improves riding conditions since the plowed roads are like groomed trails. Harvesting of timber opens up the forest which results in more snow accumulation and can actually improve snowmobiling and cross-country skiing opportunities.

H. CUMULATIVE EFFECTS ANALYSIS - Eight Principles of CEA
1. Cumulative effects are caused by the aggregate of past, present, and reasonably foreseeable future actions.
2. Cumulative effects are the total effect, including both direct and indirect effects, on a given resource, ecosystem, and human community of all actions taken, no matter who (federal, nonfederal, or private) has taken the actions.
3. Cumulative effects need to be analyzed in terms of the specific resource, ecosystem, and human community being affected.

4. It is not practical to analyze the cumulative effect of an action on the universe; the list of environmental effects must focus on those that are truly meaningful.
5. Cumulative effects on a given resource, ecosystem, and human community are rarely aligned with political or administrative boundaries.
6. Cumulative effects may result from the accumulation of similarly effects or the synergistic interaction of different effects.
7. Cumulative effects may last for many years beyond the life of the action that caused the effects.
8. Each affected resource, ecosystem, and human community must be analyzed in terms of the capacity to accommodate additional effects, based on its own time and space parameters.

For this analysis, the affected area is defined at three different spatial scales: project area (roughly Conde Creek watershed), Key watershed (North and South Forks Little Butte Creek) and the HUC-5 watershed (the entire Little Butte Creek watershed).

Past actions generally refer to those post-European settlement, for example, commercial timber harvest on public and private land, road construction, and agricultural development in the valley bottom. For a summary of the effects of past actions, see the Little Butte Creek Watershed Analysis (pages 121-150). The present action is defined as the Conde Shell project. Reasonably forseeable future *federal* actions include upcoming scheduled BLM projects. Personal communication with representatives from the Forest Service indicated that there are no major Forest Service projects being planned in the Little Butte Creek Watershed at this time. For reasonably forseeable private actions, BLM assumes that all private forest land would be clearcut.

AQUATIC, HYDROLOGY, AND SOIL - Proposed Action Alternative
The long term cumulative effects of upland and Riparian Reserve treatments would promote late successional characteristics including the long term recruitment of Coarse Woody Material. Thinning in uplands and pruning/thinning in treatment areas outside riparian corridors would reduce fire hazard. Fires in treated areas would likely be smaller and less severe. These smaller fires would create a patchy mosaic of vegetation sizes and types across the landscape, increasing habitat diversity for both aquatic and terrestrial wildlife. Oak woodlands would be healthier and more closely resemble pre fire-suppression activities. The Riparian Reserves proposed for no-treatment under this alternative would benefit from reduced fuel loading and improved stand structure in treated adjacent uplands. Overall reduction in fire hazard would reduce risk to salmonid egg and juvenile survival, soil invertebrates and mycorrhizae, and associated delivery of upland nutrients to streams and hyporheic zones, and to existing riparian vegetation.

As Riparian Reserves attain late-successional characteristics, summer low flows and stream temperatures may improve. However, improvements in water quantity and temperature would be limited by management on private land and water diversions.

Overall trends in fine sediment input to streams are not anticipated to increase. Short term, there would be a slight increase in fine sediment production due to road maintenance and improvements, culvert replacement, and log hauling. This increase in sediment are expected to last about one year after road improvements are made. After the initial flush of sediment is dispersed, sediment production would decrease. Long term, sedimentation production would decrease due to less roads, improved road drainage, and renovated existing roads. Fine sediment delivery due to BLM roads would decrease over time, given the proposed

improvements throughout the watershed. Increased peak flows due to vegetation treatments probably would not increase sediment delivery to the stream systems because of the well established riparian reserves and sediment delivery would be less than what would occur at present following a wildfire.

Overall, the increase in riparian health, increased amounts of instream wood, increase in small stream channel capacity to store water, decrease in road-caused peak flows, and decreased fire risk would improve the pace at which the watershed (and therefore fish habitat) can recover.

Watershed trends for peak flow may be influenced by rain on snow events from reduced stand densities on BLM-administered lands. However, the limited size and spatial scattering of treatment areas along with road drainage improvements on BLM lands would help to mitigate these effects. Continued increases in overall road densities across other ownerships in the watershed would probably offset any improvements on BLM lands, maintaining the trend toward greater road-induced peak flows in the watershed.

AQUATIC, HYDROLOGY, AND SOIL - No Action Alternative
Cumulative effects of the no action alternative would be the continuation of watershed conditions which have resulted from past actions. Roads would not be maintained, road drainage would not be improved, and inadequate culverts would not be upgraded. Road densities would remain at the current level and more roads would be open to traffic. This would result in no reduction of sediment production and my increase the potential for sediment delivery over time as roads deteriorate.

No density management or fuel reduction would occur. This would increase the potential for wildfire to occur in the project area. The increased fuel levels could result in a much more severe wildfire. Such a fire could destroy riparian vegetation, increase sediment delivery and erosion potential, and destabilize stream channels. Impacts from a large, high intensity wildfire would be much greater and effect much more of the watershed than the proposed action.

WILDLIFE - Proposed Action Alternative
In the 238,598 acre Little Butte Creek watershed area, approximately 10,000 acres are planned for treatments on federal land during the period from 2000 through 2005. Of that amount, approximately 5,000 acres are planned as pine, regeneration, or mistletoe prescriptions, which may result in canopy closure less than 40 percent. Canopy closure less than 40 percent is too open for spotted owl dispersal and would also have detrimental effects to some other species of wildlife. Although the quantity of spotted owl habitat is reduced in the short-term, the overall quality of habitat is expected to improve over the long-term due to these projects.

In the long-term, density thinning treatments are expected to improve forest health, encourage late successional characteristics, and reduce fire hazard. Treatments are designed to make it possible to reintroduce prescribed fire into the ecosystem. When fires do occur in treated stands, they would be less severe. The long-term effect of thinning and the reintroduction of fire is to move the forest landscape toward larger trees and healthier forests.

The exclusion of fire has resulted in a loss of habitat diversity across the landscape from historic conditions. Special habitats such as meadows, oak woodlands, open pine stands, and other plant communities have been declining due to lack of fire. Treatments are designed to improve forest health and restore habitats to

historic conditions. In the long-term, overall species richness would improve with the retention of habitat diversity.

Projects would result in a loss of snags, which would have detrimental effects on cavity nesters such as woodpecker species. Most of the large snags are retained in treatment areas to help mitigate this effect.

An overall net decrease in existing roads is planned in upcoming projects. Approximately 28 miles of roads are planned for closure or decommissioning in the watershed. Road closures would result in less disturbance to wildlife.

WILDLIFE - No Action Alternative
The cumulative effect to wildlife of no action would be that disturbances and vegetative succession would occur naturally (except for fire suppression), and wildlife populations and distributions would change in response to these processes. Exclusion of natural fire regimes across the landscape would continue the trend toward loss of some plant communities within open pine, oak woodlands, and grasslands. This alternative would continue to facilitate a high fire-hazard.

Future Forseeable Actions
The Ashland Resource Area is planning four other projects in the Little Butte Watershed for the next decade (Table 13). All are in the Key watershed with the exception of the Antelope Project, which is located in the Antelope Creek subwatershed. The Butte Falls Resource Area in the BLM Medford District is planning to implement the Bieber Wasson project which is partially located in the North Fork of the Little Butte Creek subwatershed (Table 13).

Table 13: Upcoming BLM projects in the Little Butte Creek Watershed and the South/North Fork Key Watershed.

Project Name	Acres Projected to be Treated[1]	Within Key Watershed	All or partially within HUC-5	Projected Sale Date[2]
Bieber Wasson	1700 (actual)	Partially	Partially	2000
Indian Soda	1775 (actual)	Yes	All	2000
Deer Lake	1400 (estimate)	Yes	All	2002
Heppsie	800 (estimate)	Yes	All	2004
Antelope	1200 (estimate)	No	All	2005

1 - Acres are those available for treatment after subtracting known owl cores, ACEC's and other reserves. Actual acreage are those acres that are proposed for treatment in an EA. Estimated acreage are for projects that have not yet been planned.
2 - Projected sale dates may change. Also note that the project activities may take place anytime within 5 years after the sale date.

The Bieber Wasson and Indian Soda projects are planned and proposed at the EA level. Proposed project activities include several different kinds of forest management, culvert removal, road decommissioning,

road closure and riparian fencing (Tables 14 and 15). Details are included in the Bieber Wasson project EA (#OR-110-99-15), and the Indian Soda EA (#OR-110-00-03). EA's for Deer Lake, Heppsie, and Antelope have not been conducted at this time.

Table 14: Comparison of road work and riparian fence construction proposed in Conde Shell, Indian Soda, and Bieber Wasson projects within the Little Butte Creek watershed.

Type of Activity	Conde Shell	Indian Soda	Bieber Wasson	Total
Road decommissioning (mi.)	5	5	3.5	13.5
New road construction (mi.)	0	1.1	0	1.1
New permanent road closures (mi.)	22.6	23	2.9	48.5
New seasonal road closures (mi.)	0	0	8.8	8.8
Riparian fencing	none	½ acre	200'	na
Springs fenced (number)	0	2	1	3

Table 15: General types of silvicultural prescriptions in the Conde Shell, Indian Soda, and Bieber Wasson projects and the percent of area of the North and South Forks Key Watershed and Little Butte Creek HUC-5 Watershed that these prescriptions cover. The Key Watershed = 86,776 acres; the HUC-5 Watershed = 238,598 acres. All numbers are in acres unless otherwise noted.

Type of Prescription	Conde Shell	% Key	% HUC-5	Indian Soda	% Key	% HUC-5	Bieber Wasson	% Key	% HUC-5	Total	% Key	% HUC-5
Density Mngmt. Select Cut	1915	2.2	0.8	1775	2.0	0.7	1094	1.3	0.5	4784	5.5	2.0
Regeneration Shelterwood Mortality	0	0	0	0	0	0	606	0.7	0.3	606	0.7	0.3
TOTAL	**1915**			**1775**			**1700**			**5390**	**6.2%**	**2.2%**

In the Bieber Wasson project, 1700 acres of forest are proposed for some kind of harvest (Table 15). Of this, 606 acres are regeneration, shelterwood, or "mortality" prescriptions, all of which reduce canopy closure below 40%. Combined with 1094 acres of density management in the Bieber Wasson project and 3690 acres of density management ("thinning from below" with small openings of approximately ½ acre) in the Conde Shell and Indian Soda projects, the total acreage impacted by these three projects is still only 6.2% of the Key watershed and 2.2% of the HUC-5 watershed (Table 15). Therefore, it is unlikely that the effects of these projects, both positive or negative, could be noticed at the larger spatial scales of the Key and HUC-5 watersheds. When the proposed treated acres for all of the foreseeable future projects are combined, treatments are planned on 8.7% of the Key watershed-- 3.7% of the HUC-5.

However, 50% of the land in the Little Butte Creek watershed is in private ownership. Of this, 42% is owned by timber companies. If we assume that the private forest lands would be clearcut in the foreseeable future, then adding the proposed BLM projects would increase the area impacted by forest treatments in the watershed to approximately 25%. However, this is a very conservative estimate. Much of the private forest land owned by timber companies has already been heavily harvested within the last 30 years. These stands are in various states of recovery and regrowth. Many of these stands would not be available for commercial harvest for at least 10 to 20 more years.

Additional cumulative affects analysis are in Appendix C.

I. CRITICAL ELEMENTS

The following elements of the human environment are subject to requirements specified in statute, regulation, or executive order and must be considered in all EA's.

Table 12: Critical Elements

Critical Element	Affected Yes	Affected No	Critical Element	Affected Yes	Affected No
Air Quality		✔ **	T & E Species		✔ *
ACECs		✔*	Wastes, Hazardous/Solid		✔
Cultural Resources		✔*	Water Quality		✔ **
Farmlands, Prime/Unique		✔	Wetlands/Riparian Zones		✔ **
Floodplains		✔	Wild & Scenic Rivers		✔
Nat. Amer. Rel. Concerns		✔	Wilderness		✔
Invasive, Nonnative Species		✔**	Environmental Justice		✔

*These affected critical elements could be impacted by the implementing the proposed action. Impacts are being avoided by project design.

**These affected critical elements would be impacted by implementing the proposed action. The impacts are being reduced by designing the proposed action with Best Management Practices, Management Action/Direction, Standard and Guidelines as outlined in the Environmental Impact Statements (EIS)/Record of Decisions *(RMP) (USDI BLM 1995)(USDA FS; USDI BLM 1994*) tiered to in Chapter 1. The impacts are not affected beyond those already analyzed by the above mentioned documents.

CHAPTER 5
List of Agencies and Persons Consulted

SUMMARY OF PUBLIC INVOLVEMENT

During the scoping period, a letter explaining the project and requesting issue/concern identification was mailed (December 11, 2000) to the Little Butte Creek Watershed Analysis mailing list and other interested parties. Three responses were received and reviewed by the ID Team. Upon completion of this EA, a legal notification was placed in the Medford Mail Tribune offering a 30-day public review and comment period. For additional information, please cont Bill Yocum at (541)618-2384.

DISTRIBUTION LIST AND AVAILABILITY ON THE INTERNET

This EA was distributed to individuals on the BLM updated mailing list from the scoping process. It was also sent to the following agencies and organizations.

Little Butte Watershed Council
Jackson Co. Stockmen's Assoc.
Klamath Siskiyou Wildlands Center
Friends of the Greensprings
The Pacific Rivers Council
Oregon Department of Fish and Wildlife
Southern Oregon Timber Industry Assoc.
Jackson Co. Commissioners
Little Butte Creek Watershed Council
Jackson Soil & Water Conservation Dist.
Audubon Society
Headwaters
Oregon Natural Resource Council
Association of O&C Counties
Oregon Department Forestry
Southern Oregon University
Rogue River National Forest

TRIBES

The Confederated Tribes
Cow Creek Band of Umpqua Indians
Confederated Tribes of Grand Ronde
Confederated Tribes of Siletz
Klamath Tribe
Quartz Valley Indian Reservation (Shasta Tribe)
Shasta Nation
Confederated Bands [Shasta]
Shasta Upper Klamath Indians

Confederated Tribes of the Rogue-table Rock and Associated Tribes

AGENCIES CONSULTED

A. Federal Agencies

U.S. Fish and Wildlife Service
U.S. National Marine Fisheries Service
U.S. Forest Service

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APPENDICES

APPENDIX A: PROPOSED ACTIVITIES IN HARVEST UNITS

Table A-1: Proposed silvicultural prescriptions, yarding systems, fuel treatments and volume for each harvest unit in the Conde Shell Area (Map of unit locations are available by request (541)618-2384)

UNIT	UNIT ACRES	SILVI. METHOD 1/	YARDING SYSTEM 2/	FUELS MGT 3/	VOLUME CUT/ACRE (range)(MBF)	VOLUME CUT/UNIT (range)(MBF)
3	14	WF	CR/H	HP/UB/SL	4 - 7	56 - 98
4	32	WF	CR	HP/UB/SL	4 - 7	128 - 224
5	4	WF	CR	HP/UB/SL	4 - 7	16 - 28
6	3	WF	CR/H	HP/UB/SL	4 - 7	12 - 21
7	62	MC	CR	HP/UB/SL	2 - 4	124 - 248
8	149	MC	CR	HP/UB/SL	4 - 7	596 - 1043
9	34	P	CR	HP/UB/SL	2 - 5	68 - 170
10	35	MC	CR/H	HP/UB/SL	2 - 4	70 - 140
11	8	MC	CR	HP/UB/SL	4 - 7	32 - 56
12	135	MC	CR	HP/UB/SL	4 - 7	540 - 945
14	11	MC	CR	HP/UB/SL	2-4	22 - 44
15	2	WF	CR	HP/UB/SL	2 - 4	4 - 8
16	6	WF	CR/H	HP/UB/SL	2 - 4	12 - 24
17	55	WF	CR/H	HP/UB/SL	2 - 4	110 - 220
18	17	WF	CR/H	HP/UB/SL	4 - 7	68 - 119
19	14	WF	CR/H	HP/UB/SL	4 - 7	56 - 98
20	33	WF	CR	HP/UB/SL	2 - 5	66 - 165
21	18	WF	CR	HP/UB/SL	1 - 2	18 - 36
22	17	WF	CR	HP/UB/SL	4 - 7	68 - 119
23	17	WF	CR	HP/UB/SL	4 -7	68 - 119
24	38	WF/M	CR	HP/UB/SL	2 - 4	76 - 152
25	80	WF/M	CR	HP/UB/SL	2 - 4	160 - 320
26	46	MC	CR	HP/UB/SL	4 - 7	184 - 322
27	19	WF	CR	HP/UB/SL	1 - 2	19 - 38
28	24	WF	PS/H	HP/UB/SL	4 - 7	96 - 168
29	100	WF	CR	HP/UB/SL	1 - 2	100 - 200
31	202	WF/MC	CR	HP/UB/SL	2 - 4	404 - 808
32	1	MC	CR	HP/UB/SL	1 - 2	1 - 2

UNIT	UNIT ACRES	SILVI. METHOD 1/	YARDING SYSTEM 2/	FUELS MGT 3/	VOLUME CUT/ACRE (range)(MBF)	VOLUME CUT/UNIT (range)(MBF)
33	43	WF	CR	HP/UB/SL	1 - 2	43 - 86
34	20	WF	CR	HP/UB/SL	1 - 2	20 - 40
35	125	M/MC	CR	HP/UB/SL	4 - 7	500 - 875
36	144	WF	CR	HP/UB/SL	4 - 7	576 - 1008
38	27	WF	CR	HP/UB/SL	2 - 4	54 - 108
39	9	WF	CR/H	HP/UB/SL	4 - 7	36 - 63
40	359	WF/MC	CR	HP/UB/SL	2 - 6	718 - 2154
41	3	WF	CR	HP/UB/SL	4 - 7	12 - 21
42	2	WF	CR/H	HP/UB/SL	4 - 7	8 - 14
43	7	MC	CR	HP/UB/SL	2 - 4	14 - 28
Total	1915					

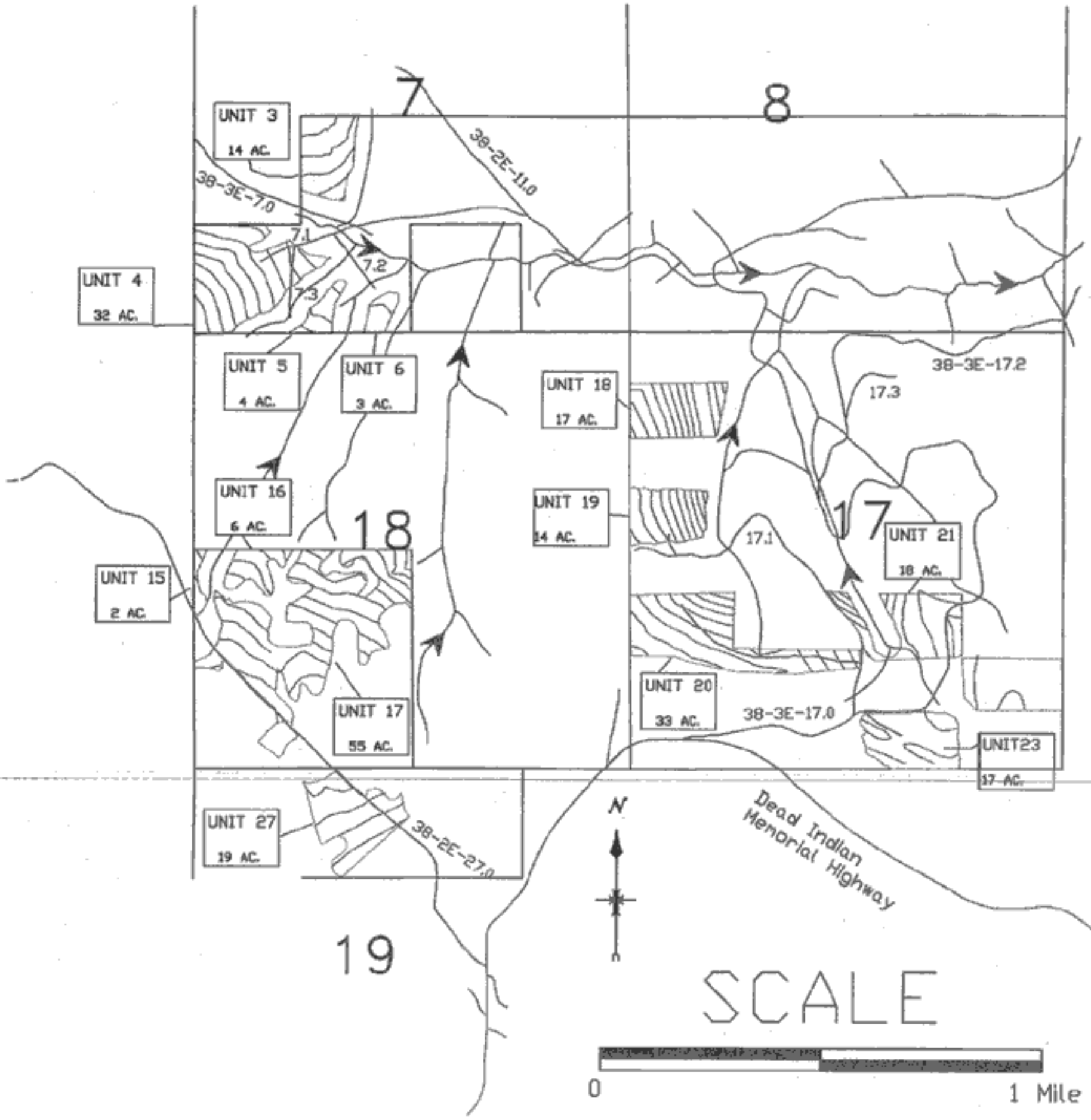
FOOTNOTES:

1/ Silvicultural Prescriptions (designates dominate prescription)
WF=White fir M=Mistletoe
MC=Mixed Conifer P=Pine

2/Yarding Systems
CR=Crawler PS=Cable H=Helicopter

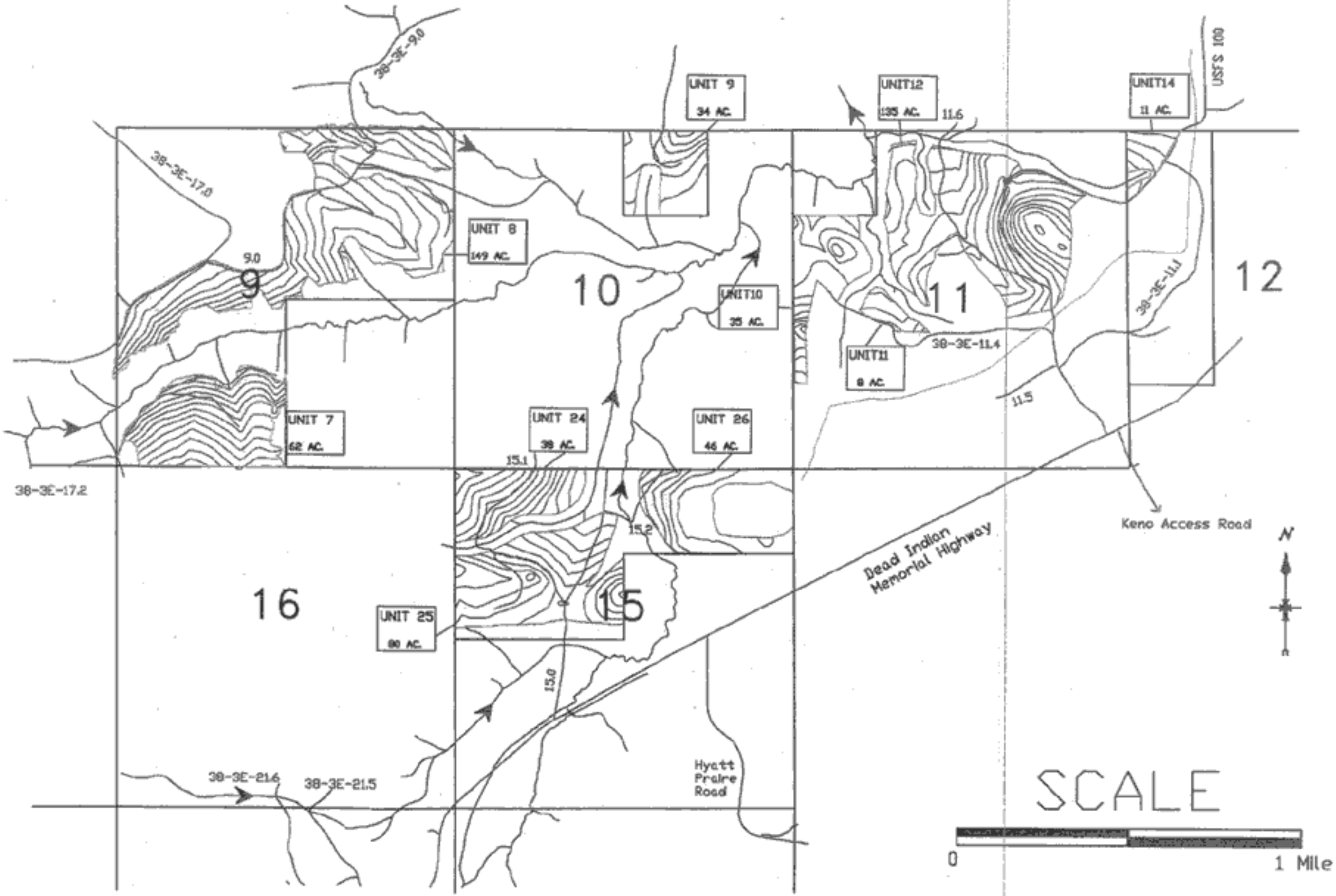
3/Fuels Management
HP=Handpile, cover and burn UB=Underburn Sl=Slashing

CONDE SHELL E.A. MAP
PROPOSED COMMERCIAL HARVEST UNITS
T.38S., R.3E, SEC. 7, 8, 17, 18, 19



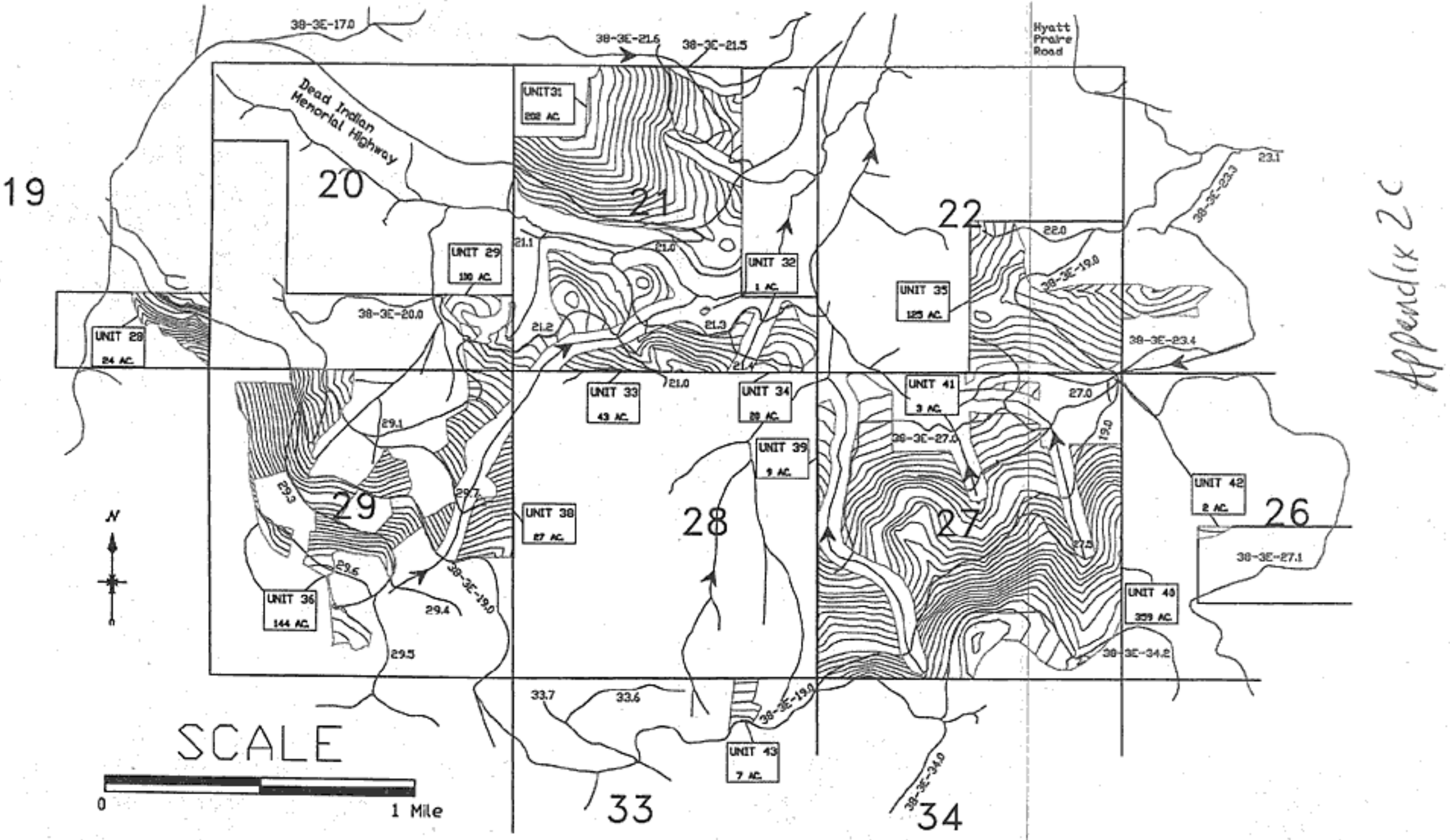
Appendix 2A

CONDE SHELL E.A. MAP
PROPOSED COMMERCIAL HARVEST UNITS
T.38S., R.3E, SEC. 9, 10, 11, 12, 15
Page 3 of 4



Appendix 2B

CONDE SHELL E.A. MAP
PROPOSED COMMERCIAL HARVEST UNITS
T.38S., R.3E, SEC. 19, 20, 21, 22, 23, 26, 27, 28, 29



Appendix 2C

APPENDIX B: PROPOSED ROADWORK

Existing Roads

Road	Mileage	Surface	Control	Poss. Impr / comment	Seasonal
38-2E-11	0.44	PRR	BL		1
38-2E-11	5.19	ASC	BL		1
38-3E-3.0	0.30	NAT	BL		1
38-3E-7.0	0.10	NAT	BL	4" ABC	1
38-3E-7.1	0.71	NAT	BL	4" ABC	1
38-3E-7.2	0.15	NAT	BL	Decommission	1
38-3E-7.3	0.20	NAT	BL	4" ABC	1
38-3E-9.0	1.35	ASC	BL		1
38-3E-9.1	0.40	NAT	BL	8" ABC	2
38-3E-9.2	0.10	NAT	BL	Decommission	1
38-3E-11.0	1.62	PRR	BL		2
38-3E-11.1	0.98	NAT	BL		1
38-3E-11.2	0.15	NAT	BL		1
38-3E-11.4	0.80	PRR	BL		1
38-3E-11.5	0.83	NAT	BL		1
38-3E-11.6	0.44	ASC	BL		1
38-3E-11.7	0.14	NAT	BL	Decommission	1
38-3E-15A	0.24	PRR	BL	4" ASC	2
38-3E-15B	0.42	NAT	BL		1
38-3E-15.1	1.38	NAT	BP	4" ASC to MP 0.57 (BLM land only)	1
38-3E-15.2	0.30	ASC	B L		1
38-3E-15.3	0.25	NAT	BL		1
38-3E-17(A-C2)	5.34	BST	BL		0
38-3E-17(D-F)	6.00	BST	BL		0

Road	Mileage	Surface	Control	Poss. Impr / comment	Seasonal
38-3E-17.1	0.60	NAT	BL		1
38-3E-17.2A	1.05	ABC	BL	4" ASC/Gate	2
38-3E-17.2B	0.71	NAT	BL	8"ABC on 0.21 miles	2
38-3E-17.3	1.18	NAT	BL		1
38-3E-17.4	0.45	NAT	BL	Decommission	1
38-3E-17.5	0.42	NAT	BL		1
38-3E-17.6	0.18	NAT	BL	Decommission	1
38-3E-18B	1.04	NAT	BL	Natural Decommission	1
38-3E-19A/B	3.70	BST	BL		1
38-3E-19C/D	2.81	ASC	BL	4" ASC	2
38-3E-20	0.80	NAT	BL	Decommission	1
38-3E-20.1	0.29	NAT	BL	Decommission	1
38-3E-20.2	0.23	NAT	BL	Decommission	1
38-3E-21A	0.35	ABC	BL	4" ASC	2
38-3E-21B1	0.20	ABC	BL	4" ASC	2
38-3E-21B2	0.21	ABC	BL	Gate	1
38-3E-21.1	0.31	ABC	BL		1
38-3E-21.2	0.93	ABC	BL		2
38-3E-21.3A	0.39	ABC	BL	4" ASC/Gate	2
38-3E-21.3B	0.38	ABC	BL	4" ASC	2
38-3E-21.4	0.38	ABC	BL	4" ASC	2
38-3E-21.5	0.43	NAT	BL	8" ABC	1
38-3E-21.6	0.41	NAT	BL	8" ABC	1
38-3E-22	0.40	NAT	BL	Decommission	1
38-3E-23.1	1.25	NAT	BL		1
38-3E-23.3	0.44	NAT	BL		1
38-3E-23.4	0.52	NAT	BL		1
38-3E-27	1.50	NAT	BL	8" ABC/Gate	2
38-3E-27.1A	0.07	NAT	BL		1

Road	Mileage	Surface	Control	Poss. Impr / comment	Seasonal
38-3E-27.1B	1.15	NAT	PV		1
38-3E-27.1C	0.53	NAT	BL		1
38-3E-27.1D	0.39	NAT	PV		1
38-3E-27.1E	0.16	NAT	PV		1
38-3E-27.1F	0.05	NAT	BL		1
38-3E-27.1G	0.10	NAT	BL		1
38-3E-27.2	0.35	NAT	BL	Decommission	1
38-3E-27.3	0.60	NAT	BL	Decommission	1
38-3E-27.5	0.32	NAT	BL	Decommission	1
38-3E-29(A-B)	1.50	PRR	BL	4" ASC on first 0.31 miles/Gate	2
38-3E-29.1	0.70	PRR	BL	4" ABC	2
38-3E-29.3	1.00	PRR	BL	4" ABC	2
38-3E-29.4	0.40	NAT	BL	Decommission	1
38-3E-29.5	0.60	NAT	BL	Decommission	1
38-3E-29.6	0.20	NAT	BL	Decommission	1
38-3E-29.7	0.55	ABC	BL		1
38-3E-32A	1.93	ASC	BL		2
38-3E-32B	0.70	NAT	BL		1
38-3E-32.2	0.17	NAT	BL	Decommission	1
38-3E-32.3	0.1	NAT	BL	Decommission	1
38-3E-32.5	0.22	NAT	BL		1
38-3E-33.0	2.90	ASC	BL		2
38-3E-33.1	0.55	ABC	PB		1
38-3E-33.3	1.20	ABC	BL		1
38-3E-33.4	1.00	ABC	BL		1
38-3E-33.5A1	0.14	ABC	BL		1
38-3E-33.5A2	0.36	NAT	BL		1
38-3E-33.6	0.74	GRR	BL		1
38-3E-33.7	0.13	GRR	BL		1

Road	Mileage	Surface	Control	Poss. Impr / comment	Seasonal
38-3E-34.0	0.49	GRR	BL		1
38-3E-34.1	0.71	GRR	BL		1
38-3E-34.2	2.27	NAT	BL		1
Total Mileage:	71.67				

Control Key:
BL = Bureau of Land Management
PB = Pvt./BLM Imp
PV = Private
NE = NON-EXCL ESMT

Surface Type Key:
NAT = Natural
ASC = Agg. Surf. Course
ABC = Agg. Base Course
BST = Bitumin. Surf. Treatment
PRR = Pit Run Rock
GRR = Grid Rolled

Seasonal Restriction
None = 0
10/15 - 6/15 = 1
11/15 - 5/15 = 2

Types of Decommission are as follows;

1. Natural Decommission – Section of the road would be allowed to decommission naturally but may include selective ripping, removal of drainage structures, construction of water bars, and barricades.

APPENDIX C: CUMULATIVE ANALYSIS

Vegetation (Forestry)

With no forest stand density reduction, slow tree growth and vigor would result in individual tree and perhaps stand mortality. If severe stand mortality results, silvicultural options in the future would be reduced. It is possible that after bark beetle attack and Douglas-fir dwarf mistletoe mortality, there may be less than 16 trees per acre remaining in some forest stands. If this happens we would not be able to harvest timber for approximately 30 to 50 years.

Pine species would continue to decrease in number if large openings are not created for these shade intolerant species. The more shade tolerant white fir and Douglas-fir would continue to dominate the forest.

Where dense forest stands persist over time, canopy closure would remain at 90 to 100 percent. When tree mortality is singular or in small patches, canopy closure would be approximately 50 to 80 percent. Where large patches of trees die, canopy closure would be 0 to 40 percent.

Fire hazard would increase with the abundance of dead vegetation and ladder fuels.

There is a wide variety of silvicultural prescriptions because of the wide variety of present day forest stand structure. A variety of prescriptions are needed to create future old-growth forest stand structure. Approximately 380 acres of moist Douglas-fir, 361 acres of mixed conifer forest, 330 acres of pine series and dry Douglas-fir forest, and 704 acres of forest infected with dwarf mistletoe are being treated by the prescriptions. Canopy closure would be more variable after treatment. On Douglas-fir and mixed conifer sites canopy closure would range from 25 (in small patches) to 50 percent (in larger homogeneous patches). On pine sites canopy closure would range from 20 to 40 percent in a similar pattern. Average weighted canopy closure for the Conde Shell would be approximately 38 percent .

Canopy closure calculations by prescription type for the Conde Shell.

Prescription Type	Unit#	Unit Acres	% of Project Area	Resulting Canopy Closure[1]
Moist Douglas-fir	5	110		50
	27	8		50
	43	4		50
Total Acres/Weighted Closure		122	7	50
Mixed Conifer	4	25		40
	18	8		50
	19	22		50
	20	16		50
Total Acres/Weighted Closure		71	4	46
Dry Douglas-fir	31	2		45
	36	2		45
Total Acres/Weighted Closure		4	1	45
Pine Rx's	2	140		40

Prescription Type	Unit#	Unit Acres	% of Project Area	Resulting Canopy Closure[1]
	6	37		20
	7	3		45
	32	88		40
	40	7		40
	42	6		35
Total Acres/Weighted Closure		281	16	37
Mistletoe	1	71		30
	3	39		25
	10	11		33
	11	2		45
	12	4		40
	13	19		40
Mistletoe	21	24		35
	26	12		40
	28	10		40
	29	10		40
	30	77		40
	34	13		40
	38	2		40
Total Acres/Weighted Closure		294	16	35
Mixture of Rx's				
Moist DF/Mistletoe	8	17		45
Moist DF/Mistle/Pine	9	241		33
Mixed Conifer/Mistle/Pine	14	110		40
"	15	180		33
Mistletoe/Pine	16	70		33
"	22	5		35
"	23	26		45
Dry DF/Pine	24	22		45
Mistletoe/Pine	25	30		40
"	35	48		40

Prescription Type	Unit#	Unit Acres	% of Project Area	Resulting Canopy Closure[1]
Dry DF/Pine	37	23		40
Mistletoe/Pine	39	11		40
Moist DF/Mistle/Pine/Dry DF	41	207		40
Moist DF/Mistletoe	44	35		45
Total Acres/Weighted Closure		1003	56	37
GRAND TOTAL ACRES		2028		

By applying various landscape prescriptions, future silvicultural options would be increased. In the majority of forest stands that would be commercially thinned, commercial thinning could occur again, or regeneration harvest could occur in 10 to 40 years. Pole sized stands could be entered in approximately 40 years. The prescriptions would also assume that drought resistant conifer species such as ponderosa pine and incense cedar would be present in future stands where appropriate in regard to site conditions.

If surrounding private lands are clearcut, our forest stands would be the only patches of forest left to provide late-successional habitat. Surrounding BLM lands would be managed with prescriptions to improve late-successional habitat. This would assure that forest stands are healthier on a larger land scale. Forest canopy closures would be in the range of natural variability but sometimes below canopy closures recommended for full hydrologic recovery in the transient snow zone. These small areas (less than 1-acre) of open canopy closure would grow to full hydrologic recovery as specified in the watershed analysis in approximately 10 to 30 years. Treating the forest stands would promote forest stand connectivity with late-successional characteristics for the future.

Special Status Plants

Timber harvest, fire suppression, and rural development have had the greatest effect on Special Status and S&M plant species in the Little Butte Creek Watershed. Rural development has caused the most permanent changes to the natural plant communities. Timber harvest and fire suppression cause changes to plant community structure and composition.

Past actions in the watershed have undoubtedly affected undiscovered Special Status and S&M plant sites and their habitats. On federal land, Special Status plant list revisions and the development of the S&M list protects species without previous management requirements. While some populations may have been adversely affected or lost, species viability is maintained by other managed sites and the establishment of late successional reserves.

Current and future timber harvest would further serve to fragment suitable habitat for many Special Status and S&M plant species. Fuels treatments would cause short term adverse effects from habitat disturbance. Unoccupied suitable habitat and undiscovered sites would be lost. Long term effects from the mostly thinning operations and the reintroduction of fire would be beneficial.

Wildlife

Past actions that have had the greatest influence on existing wildlife/wildlife habitat conditions in the area are timber harvest on federal and private lands, fire suppression, and residential development (Little Butte Creek Watershed Analysis, 1997). Past timber management practices were usually to clearcut forest stands. This resulted in fragmentation of the forest landscape and loss of habitat for forest dependent species. Fire exclusion has a negative effects on the overall health of forest stands. The exclusion of fire caused a trend toward the loss of some habitat types such as grassy meadows, open pine stands, and oak woodlands. Grazing

practices have caused a decline in grassland habitat health.

In 1994, the Northwest Forest Plan established a Late Successional Reserve (LSR) of 52,980 acres in the Little Butte Creek watershed to preserve late successional forest habitat for wildlife species dependent on this type of habitat such as the spotted owl. This large preserve has had a positive effect on overall wildlife habitat conditions and connectivity between late successional forest stands in the Little Butte Creek watershed.

The cumulative effects of these projects include the short-term loss of canopy closure in forest stands. The long-term effect of thinning and the reintroduction of fire is to move the forest landscape toward larger trees and healthier forests. There would be a loss of snags, which would have detrimental effects on cavity nesters such as woodpecker species. Pine, regeneration, or mistletoe prescriptions may result in canopy closure less than 40 percent, which is too open for spotted owl dispersal and would have detrimental effects to some other species of wildlife.

Scattered parcels of private land immediately surrounding the Conde Shell are currently owned by private logging companies. A much larger percentage of private lands surrounds the norther portion of the watershed north of Highway 140 around BLM (Butte Falls Resource Area) lands and is owned by several different private timber companies.

The Conde Shell area is part of the Little Butte Creek 5th field watershed. The Northwest Forest Plan and subsequent direction call for an analysis of late successional habitat to be performed at the 5th field watershed scale. Also, late successional areas are to be identified for retention in watersheds where late successional habitat is relatively scarce, or is expected to become scarce in the future.

The BLM analysis of late successional habitat in this watershed was performed for the third year review of the NWFP. This analysis resulted in the following conclusion:

> *"Based on the data presented, this watershed currently meets the 15% S&G. The current BLM reserves contain 10,589 acres of late successional habitat, or 34.1 % of the BLM forest lands. A full harvest scenario on BLM lands would modify 8,255 acres of late seral vegetation over a 10 year time period."*

The analysis indicates that the 5th field watershed would continue to meet the 15% retention S&G after harvest of the planned timber sales in the Little Butte planning area. The federal lands in the watershed are mostly USFS (75%) with the remainder being BLM. There is a large Late Successional Reserve on the USFS portion of the watershed which provides a significant portion of the late successional habitat in the watershed. Other reserves dispersed throughout the Matrix and contributing late successional habitat towards the 15% S+G are spotted owl core areas, Great grey owl protection buffers, and some riparian reserves. Late successional stands that occur in existing reserves in the Little Butte planning area are well distributed within the planned harvest areas.

APPENDIX D: AQUATIC CONSERVATION STRATEGY OBJECTIVES

The South Fork Little Butte Creek-Dead Indian Creek subwatershed (sixth-level HUC #171003070805) includes 26,205 acres of South Fork Little Butte Creek extending from below Beaver Dam Creek down to and including Grizzly Creek. Approximately 5500 acres of this area are under the jurisdiction of the Bureau of Land Management. South Fork Little Butte Creek is designated as a Tier 1 Key Watershed in the Northwest Forest Plan. The project area encompasses approximately 42% of the South Fork Little Butte Creek-Dead Indian Creek subwatershed (all ownerships), located in the upper portions of Dead Indian Creek.

The Conde Shell EA Project Area encompasses the headwaters of Dead Indian Creek, as well as Conde Creek, a major Dead Indian Creek tributary. Dead Indian Creek is the largest tributary in this subwatershed, draining approximately 15,771 acres in the southeast portion of the Little Butte Creek watershed. Anadromous fish are not present within the project area due to a natural barrier located approximately 3/4 mile above the confluence of Dead Indian Creek and South Fork Little Butte Creek. This barrier is approximately 4 miles downstream of the project area.

For the purposes of this ACS analysis, the hydrology and fisheries team defined "project level" as encompassing the land within the project boundaries, essentially the Conde Creek watershed.

1. Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.

Project-level: At the project level, the primary treatment objective is to restore landscape-level processes and condition. Although the response (of the vegetation for example) to the projects won't be immediate, over the long term silvicultural thinning, plantation recovery, fire reintroduction and sediment source reduction should improve nutrient cycling, groundwater flow, riparian vegetation connectivity, large woody debris routing and many other spatially and/or temporally large features and processes.

Key Watershed Level: No effect at this large spatial scale.

HUC-5 Level: Effects of this project may well be swamped by the large spatial scale of the Little Butte Creek watershed.

2. Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.

Project level: Road decommissioning and blocking should reduce road-caused sedimentation over the longterm and allow riparian vegetation to recolonize the road surfaces. As trees grow up in the road bed, their roots loosen the compacted soil, restoring groundwater flow, thus improving the humid character of the riparian area.

Key Watershed level: There would be some small improvement at the Key Watershed scale, simply due to restored drainage networks in Conde Creek.

HUC-5 level: The effects of the actions in Conde Creek would likely be swamped by actions on private land throughout the HUC-5, and also just due to the HUC-5's large spatial scale.

3. Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.

Project level: Long term increases in large woody material facilitated by PCT would help reestablish channel structure. As plantations mature in and around the Riparian Reserves, more shade and woody material would be available to the streams. Replacing a culvert with a rocked

ford would allow the stream to reestablish it's natural shape, no longer confined by the culvert.
Key Watershed level: No effect at this large spatial scale.
HUC-5 level: No effect at this large spatial scale.

4. Maintain and restore water quality necessary to support healthy riparian, aquatic and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.

Project level: The cumulative effects of many small-scale improvements in riparian vegetation (e.g. thinning plantations, removing culverts, etc.) *may* decrease water temperatures over time by improving shade, large wood recruitment, and reestablishing hydrologic function. The implementation of riparian reserves as part of this project would promote decreases in direct solar radiation on the stream channel as shade recovers from the riparian harvests of the past few decades. This would lead to significant decreases in maximum summertime temperatures and diurnal fluctuation over the long term. Also see ACS Objective #5.
Key Watershed level: No effect at this large spatial scale.
HUC-5 level: No effect at this large spatial scale.

5. Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.

Project level: Road improvements, culvert replacements and decommissioning may create short-term increases in fine sediment production, but not at a level that would affect fish. Ultimately, road-related fine sediment input would be reduced, improving habitat for resident fish. Closing and gating roads in the winter would prevent vehicles from rutting dirt roads and accelerating soil erosion. Sediment issues in this area are a result of past management activities on private and public land. It is not expected that harvest prescriptions in this project would degrade aquatic habitat. Riparian Reserves would continue to provide protection.
Key Watershed level: Some improvement, mostly by reducing fine sediment input during high water events.
HUC-5 level: No effect at this large spatial scale.

6. Maintain and restore instream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.

Project-level: Silvicultural thinning may cause a slight increase in peak flows due to the more open canopy and increased soil compaction. There would be some increase in the risk of a high flow event (rain-on-snow) within the next 5-15 years; but in the long term, the risk disappears as the canopy recovers. Low flows should remain the same. None of the flow changes would be significant enough to affect listed fish and these potential flow changes are within the natural range of variability.
Key Watershed level: No effect due to the large spatial scale.
HUC-5 Level: No effect due to the large spatial scale.

7. Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.

Project level: No change.
Key Watershed level: No effect due to the large spatial scale.
HUC-5 level: No effect at this large spatial scale.

8. Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply

amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.

Project level*:* Riparian Reserve plant communities would improve in PCT'd areas. Trees should attain late-successional characteristics sooner, and in some treatment areas, vegetation would become more structurally diverse.

Key Watershed: No effect at this large spatial scale.

HUC-5 Level: No effect at this large spatial scale.

9. Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.

Project level*:* In the short term, mollusk buffers, owl cores and untreated Riparian Reserves would maintain habitat for terrestrial riparian species. In the long term, PCT (only done to improve habitat) should improve areas of poor quality for terrestrial riparian species and increase large wood recruitment to channels. Consequently, habitat for both aquatic and terrestrial species should improve.

Key Watershed: Minor improvements at this large spatial scale, depending on the species concerned and the spatial and temporal scales at which they operate. Otherwise, no effect.

HUC-5 Level: No effect at this large spatial scale.