



United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Salem District Office
1717 Fabry Road S.E.
Salem, Oregon 97306

IN REPLY REFER TO:

5410 (085)
South Hammer Density Management Project
Tract No. 0 1-302
EA No. OR080-00-09

Dear Reviewer,

The Bureau of Land Management, Marys Peak Resource Area, invites you to review the attached South Hammer Density Management Environmental Assessment and Finding of No Significant Impact. This document describes the issues and analyzes the probable impacts to resources from the proposed density management, essentially a thinning method based on specific project goals.

The proposed project is located in Township 15 South, Range 6 West, Section 8, W. M., in the South Fork Alsea Watershed southwest of Alpine, Oregon. Density management harvest would occur on approximately 48 acres of Riparian Reserve using skyline cable yarding systems. The proposed objectives are to manage habitat conditions for understory development which enhances structural diversity; create coarse woody debris now lacking in the riparian reserve areas; and increase diameter growth for achieving future potential coarse woody debris sources more quickly than under current growth conditions. The proposed actions are designed to attain Aquatic Conservation Strategy objectives.

We are interested in hearing from you and ask that you provide us with your comments by April 16, 2001. Please respond by then so a final decision can be made on the action. Comments specific to the alternatives and assessment of potential environmental effects would be the most helpful.

If you have questions about the environmental assessment, please call Gary Humbard at (503) 315-5981. Please send your written comments to Field Manager, Marys Peak Resource Area, Salem District, Bureau of Land Management, 1717 Fabry Road S.E., Salem, Oregon, 97306.

Sincerely,

Acting Field Manager
Marys Peak Resource Area

**UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
SALEM DISTRICT OFFICE
MARYS PEAK RESOURCE AREA**

**ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT
FOR
SOUTH HAMMER DENSITY MANAGEMENT HARVEST PROJECT**

EA NUMBER : OR-080-00-09
PREPARED BY: Interdisciplinary Team; Gary Humbar, Team Lead
AREA ENVIRONMENTAL COORDINATOR: Belle Smith

Summary: This document is an Environmental Assessment and Finding of No Significant Impact for the proposed South Hammer Density Management Harvest, tract number 01-302. The project area is located in Township 15 South, Range 6 West, Section 8, Willamette Meridian, Benton County. The land use allocation is Riparian Reserve.

Alternative 1, the proposed action, would involve a thinning harvest of 60 year-old Douglas-fir forest. Approximately eight hundred thousand board feet (800 MBF) of timber would be removed from approximately 48 acres. This action would involve timber harvest using skyline cable yarding systems.

Alternative 2 would be the same as Alternative 1, except felled trees would not be yarded from the area thinned.

Alternative 3 is the "No Action" alternative in which density management would not occur.

The environmental analysis focuses on the following issues identified through scoping and by an interdisciplinary team of BLM resource specialists:

Vegetation: Effects on native vegetation and special status/SEIS special attention species and habitats and noxious weeds.

Soils/Fuels: Effects on long-term site productivity as related to soil compaction. Effects on fuel loading and fire risk.

Water/Riparian: Effects on stream flow, channel conditions, and water quality and aquatic conservation strategy objectives .

Wildlife: Effects on special status, special attention and other wildlife species and their habitats.

Fisheries: Effects on fisheries and their habitats.

For further information, contact Gary Humbar (503-315-5981), 1717 Fabry Rd. S.E., Salem, Oregon, 97306. Comments on this environmental assessment are due **April 16, 2001**.

FINDING OF NO SIGNIFICANT IMPACT

Introduction

The Bureau of Land Management (BLM), Marys Peak Resource Area has analyzed the potential effects of a density management project in the upper drainage (Township 15 South, Range 6 West, Section 8 W. M.) of the South Fork Alsea Watershed, Benton County, Oregon. The action described in this environmental assessment (EA) is a density management harvest to enhance riparian habitat within Riparian Reserves. The action would meet the needs for forest habitat as identified in the *Salem District Record of Decision and Resource Management Plan* (the RMP; see pp. 1 and 2). Riparian Reserves were specifically designated to restore and maintain aquatic ecosystem functions. The EA is attached to and incorporated by reference in this Finding of No Significant Impact (FONSI) determination.

This FONSI and the EA are being made available for public review prior to making a decision on the action. The public notice of availability for review will be published in the *Corvallis Gazette Times* of general circulation and through notification of interested individuals, organizations, and state and federal agencies. They will also be available for review on the internet at this address: <http://www.or.blm/salem/planning>.

Finding Rationale

For the alternatives analyzed, significant impacts on the quality of the human environment would not occur based on the following criteria:

1) The alternatives are in conformance with the following documents which describe the objectives, land use allocations, and management actions/direction for BLM-administered lands in the Marys Peak Resource Area:

- *Record of Decision and Standards and Guidelines for Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (S&M ROD, January 2001)

- *Final Supplemental Environmental Impact Statement For Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (S&M FSEIS, November 2000).

- *Salem District Record of Decision and Resource Management Plan* (RMP, May 1995).

- *Salem District Proposed Resource Management Plan/Final Environmental Impact Statement* (PRMP/FEIS, September 1994).

- *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (ROD, April 1994) and the *Final Supplemental Environmental Impact Statement on Management of Habitat for Late Successional*

Forest Related Species Within the Range of the Northern Spotted Owl (SEIS, February 1994).

- *Western Oregon Program-Management of Competing Vegetation Final Environmental Impact Statement* (VMFEIS, February 1989) and the *Western Oregon Program-Management of Competing Vegetation Record of Decision* (August 1992). The VMFEIS analyzed broad scope issues and impacts for an integrated vegetation management strategy consisting of various treatments. The Record of Decision identifies treatments and provides processes to meet vegetation management objectives (p. 3) and resource management goals (p. 33).

2) The alternatives are consistent with other federal agency and State of Oregon land use plans and with the Benton County land use plan and zoning ordinances. Any permits associated with the implementation of this project would be obtained, and all requirements would be met.

3) No wild and scenic rivers, or prime or unique farmlands occur within the proposed harvest areas.

4) No development within flood plains would occur.

5) No known cultural or paleontological resources occur in the project area. A post-harvest survey would be done upon completion of the project according to *Protocol for Managing Cultural Resources on Lands Administered by the BLM in Oregon*; Appendix D dated August 5, 1998.

6) No hazardous materials or solid waste were observed in the project area nor would they be created by the proposed action. Any chemicals or fuel used on the site would be handled according to the best management practices (RMP, Appendix C).

7) Conformance of the alternatives with the Aquatic Conservation Strategy (ACS) components listed in the RMP (pp. 5 and 6) are displayed in the following table:

RELATIONSHIP OF ALTERNATIVES TO RELEVANT MANAGEMENT DIRECTION

Management Direction	Relationship of This Action
Interim Riparian Reserves	Alt. 1 (Proposed Action): Density management harvest would occur inside Riparian Reserves. Management actions/direction for Riparian Reserve include application of silvicultural practices to control stocking, etc. (RMP p.11) Alt. 2. Same as Alternative 1 except felled trees would not be harvested within the Riparian Reserves. Alt. 3: Riparian Reserves would remain undisturbed.
Key Watersheds	The proposed project area is not in a Key Watershed.

Management Direction	Relationship of This Action
Watershed Analysis	The first iteration of the <i>South Fork Alsea Watershed Analysis</i> was completed October 1995. The analysis found that coarse woody debris was lacking in Riparian Reserves (pp. 39-46). The South Fork Watershed Analyses Riparian Reserve Treatment Recommendation Update (May 2000) recommended density management for stands lacking vertical structural diversity (p. 8).
Watershed Restoration	Restoration of the condition of riparian vegetation is one of the most important components of watershed restoration to aid recovery of aquatic ecosystems (RMP p. 7)

8) The sale area does not qualify for potential wilderness nor has it been nominated as an area of critical environmental concern.

9) Project design features would assure that potential impacts to water quality from this project would be in compliance with the state of Oregon In-stream Water Quality Standards and thus the Clean Water Act.

10) In accordance with the RMP (see pp. 21-22), the amount of late-successional forest (i.e., 80 years and older) on federal lands was determined for the Upper Alsea Watershed. The 80+ forest age-classes occur on approximately 32 percent of the federal lands in the Upper Alsea Watershed. This percentage exceeds the RMP standard of 15 percent. No late-successional forest stands would be affected by this action

11) The proposed action is within the coastal zone as defined by the Oregon Coastal Management Program. This proposal is consistent with the objectives of the program and the state planning goals which form the foundation for compliance with the requirements of the Coastal Zone Act. Management actions/direction found in the RMP were determined to be consistent with the Oregon Coastal Management Program.

12) Burning would be accomplished in accordance with the Oregon state implementation plan and the *Oregon Smoke Management Plan* and thus the *Clean Air Act*.

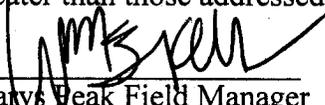
13) The proposed project is a “may affect, not likely to adversely affect” for northern spotted owls and marbled murrelets due to modification of dispersal habitat. Consultation with the U.S. Fish and Wildlife Service (USFWS) concerning listed wildlife species was completed as part of the Programmatic biological assessment dated August 11, 2000 in the North Coast Province for fiscal year 2001 which would modify the habitats of bald eagles, northern spotted owls, or marbled murrelets. This resulted in the USFWS issuing a Biological Opinion (BO #1-7-00-F-649) dated October 4, 2000. The BO determined that the level of anticipated incidental take is not likely to result in jeopardy to the northern spotted owl, the marbled murrelet, or the bald eagle. This project has been designed to be in compliance with the BO and incorporates all applicable terms and conditions from the BO.

14) Consultation with the National Marine Fisheries Service (NMFS) is in progress. The Biological Assessment (BA), which assessed potential impacts to listed fish in the Oregon Coast Evolutionary Significant Unit (ESU), was submitted to NMFS in December 2000. The BA concluded the proposed project is a "may affect, not likely to adversely affect" Oregon Coast Coho Salmon, Oregon Coast steelhead trout and sea-run cutthroat. The Letter of Concurrence, responding to that BA, is expected in March 2001. Any decision on the proposed South Hammer Density Management Project would be in compliance with the pending Letter of Concurrence.

The proposed action is local in nature, and potential adverse impacts would be short-term. Impacts were determined based on observation, available data and information, and professional training and experience of the interdisciplinary team of BLM natural resource specialists. Determining such environmental effects reduces the uncertainties to a level which does not involve unique risks. The design features identified in the EA would assure that no significant site-specific or cumulative impacts would occur to the human environment other than those already addressed in the EIS.

Finding of No Significant Impact Determination

Based on the analysis of information in the attached EA, my determination is that a new EIS or supplement to the existing FEIS are unnecessary and will not be prepared. The proposed action would not result in significant environmental impacts affecting the quality of the human environment greater than those addressed in the existing FEIS.


Marys Peak Field Manager

March 12, 01
Date

Comments regarding this environmental assessment should be received by the Bureau of Land Management, Marys Peak Resource Area, by **April 16, 2001**.

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ENVIRONMENTAL ASSESSMENT

I. PURPOSE AND NEED

A. Introduction

The Marys Peak Resource Area of the Bureau of Land Management (BLM) is proposing a density management harvest on 48 acres of Riparian Reserve in Township 15 South, Range 6 West, Section 8, Willamette Meridian, Benton County, Oregon (see Appendix A). The proposed harvest area is located approximately five air miles southwest of Alpine, Oregon.

The proposed action, described and analyzed herein, is intended to meet the needs for forest habitat as directed by the *Salem District Record of Decision and Resource Management Plan* (hereafter referred to as the *RMP*; see pp. 1 and 2). All applicable direction in the *Northwest Forest Plan* is incorporated in the *RMP*.

This environmental assessment (EA) is tiered to the *Salem District Record of Decision and Resource Management Plan (RMP, May 1995)* and the *Salem District Proposed Resource Management Plan/Final Environmental Impact Statement (PRMP/FEIS, September 1994)*. The *FEIS* analyzed broad scope issues and impacts within the President's direction to meet the need for forest habitat and forest products (p. 1). The *RMP* provides a comprehensive ecosystem management strategy for BLM-managed lands in the Salem District in strict conformance with the Northwest Forest Plan and the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (April 1994).

The *RMP/ROD* was signed by the Oregon/Washington State Director of the Bureau of Land Management on May 12, 1995. It is based on a comprehensive ecosystem management strategy for federal lands consisting of management objectives, land use allocations, and management actions/direction. Under the *RMP*, Riparian Reserves are one of the key components in the Aquatic Conservation Strategy and play a major role in managing late-successional forest conditions and biological diversity associated with native species and ecosystems (pp. 5&6).

The proposed project is located in the South Fork Alsea fifth field watershed. The BLM portion of this watershed was analyzed in the *South Fork Alsea Watershed Analysis, SFAWA, (October, 1995)* which identifies the proposed project area as a potential treatment area (p. 79 and Map 15), and the *North Fork Alsea and South Fork Alsea Watershed Analyses Riparian Reserve Treatment Recommendations Update, (RRTRU, May 2000)*, which recommends density management after site specific analysis on stands exhibiting characteristics similar to those in the proposed project area (pp.5-6 and Table 2, p.7). The *RMP* directs us to “Apply silvicultural treatments to restore large conifers in Riparian Reserves” (p. 7) and “Apply silvicultural practices for Riparian Reserves to control stocking, reestablish and manage stands, and acquire desired vegetation characteristics needed to attain Aquatic Conservation Strategy objectives” (p. 11). Desired vegetation characteristics required for proper Riparian Reserves function include the following: large trees, diverse species of trees and other vegetation, abundant and well distributed mature and understory conifers, mature to late-successional forest characteristics, and large woody debris in the channel.

The South Hammer Interdisciplinary Team (IDT) concluded that the Riparian Reserves stands in the sale area lack many of these characteristics. In addition, they do not meet Aquatic Conservation Strategy (ACS) objectives 1, 2, 8 or 9, all of which require structural and species diversity, as well as down wood and snags in all stages of decay in Riparian Reserves. Only 10 percent of BLM land within the South Fork Alsea Watershed consists of two-story stands. The proposed density management of approximately 48 acres would be implemented to initiate development of an understory. Secondary goals include accelerating tree growth and increasing the snag and down wood component in the stand.

This environmental assessment is also tiered to the *Western Oregon Program-Management of Competing Vegetation Final Environmental Impact Statement (VMFEIS, February 1989)* and the *Western Oregon Program-Management of Competing Vegetation Record of Decision* (August 1992). The *VMFEIS* analyzed broad scope issues and impacts for an integrated vegetation management strategy consisting of various treatments. The Record of Decision identifies treatments and provides processes to meet vegetation management objectives (p. 3) and resource management goals (p. 33).

This EA is a site-specific analysis of the proposed action and alternatives prepared under general management guidance provided in the *RMP*. The *RMP* is available for review in the Salem District Office. A general description of the project area may be found in this EA under Description of Affected Environment/Environmental Consequences. Additional information about the proposed project is available in the South Hammer Project EA file.

B. Scoping

Efforts to involve the public in planning for the proposed action were as follows:

- The general area was shown as Riparian Reserve in the Northwest Forest Plan and the *RMP*. These documents were widely circulated in the state of Oregon and elsewhere, and public review and comment were requested at each step of the planning process.
- A letter was mailed to interested parties on October 11, 2000 requesting initial public input. We did not receive any correspondence from the public concerning this letter.
- A news release announcing availability of the EA for public review and comment was submitted to the *Corvallis Gazette-Times*. Letters with the same information were mailed to interested individuals.
- A description of the proposal was included in the Salem Bureau of Land Management *Project Update* and mailed in December and September 2000 to more than 900 individuals and organizations on the mailing list.
- Copies of the EA are being mailed to interested individuals, interest groups and agencies.

C. Management Objectives by Land Use Allocation and Resource Program

As directed by the Northwest Forest Plan and the RMP, the primary management objectives for the project area are as follows:

Riparian Reserves (RMP pp. 9-15)

1. Provide habitat for special status, SEIS special attention and other terrestrial species.
2. Meet Aquatic Conservation Strategy objectives.

Water and Soil Resources (RMP pp. 22-24)

1. Comply with State of Oregon water quality requirements to restore and maintain water quality and to protect recognized beneficial uses in watersheds.
2. Improve and/or maintain soil productivity.

Special Status and SEIS Special Attention Species (RMP pp. 29-31)

1. Protect, manage and/or conserve habitat for these species so as not elevate their status to any higher level of concern.

II. ALTERNATIVES, INCLUDING THE PROPOSED ACTION

A. INTRODUCTION

This section describes alternatives identified by the interdisciplinary (ID) team that helped develop the South Hammer Project. This environmental assessment (EA) analyzes the proposed action, which would involve density management harvest in conifer stands on Riparian Reserve lands. Important ecological components within the project area would be retained. Forest management treatments incorporated in the proposed action conform with standard practices and design features intended to reduce the environmental effects of timber harvest and related activities. They comply with the Standards and Guidelines specified in Attachment A of the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl (ROD, April 1994)*.

B. SUMMARY OF ALTERNATIVES

Alternative 1 (Proposed Action)

Under the proposed action, density management harvest using skyline cable logging systems would remove trees on approximately 48 acres of 60 year-old trees. Some stand structural diversity such as existing snags and coarse woody debris would be retained. (Refer to Section II. C, Project Design Features, for further details.)

Alternative 2 (Density Management without Harvest)

Unit would be thinned to the same trees per acre and spacing as in the proposed action. All design features would be the same, except no trees would be removed from the project area.

Alternative 3 (No Action)

Density Management of the stand would be deferred.

C. ALTERNATIVE 1 (PROPOSED ACTION)

1. Scoping Issues

The following issues concerning the proposed action were identified through public scoping and by an ID team of BLM natural resource specialists representing various fields of science (see Section V, Interdisciplinary Team Members):

Vegetation: Effects on native vegetation and special status/SEIS special attention species and habitats and noxious weeds.

Soils/Fuels: Effects on long-term site productivity as related to compaction. Effects on fuel loading and fire risk.

Water/Riparian: Effects on stream flow, channel conditions, water quality and aquatic conservation strategy objectives.

Wildlife: Effects on special status, SEIS special attention and other wildlife species and their habitats.

Fisheries: Effects on fisheries and their habitats.

D. PROJECT DESIGN FEATURES, MITIGATION MEASURES, AND BEST MANAGEMENT PRACTICES

Project design features are operating procedures that would be included in the design and implementation of the proposed action alternative. They also include measures proposed to mitigate potential adverse environmental effects. These measures are described in Appendix C, Best Management Practices and Timber Production Capability Classification Fragile Code Guidance in the Salem District Resource Management Plan. Copies of this document can be obtained in the Salem District Office or through the internet at www.or.blm.gov/salem. The design features of this proposal are described below and mapped in Appendix A, Map 1. All acres and other numerical units are approximate. A final decision on this action will be made in conformance with the Record of Decision for the *Amendment to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (FSEIS) which was completed November 2000.

General

- Stand density would be reduced through harvest on 48 acres of 60-year-old trees in Riparian Reserves.

- Project area is located within Visual Resource Management Class IV lands which would allow management activities to dominate the view.
- The Project area would be outside Rural Interface Areas with the closest residence approximately 1.5 miles from the project area.

Water/Riparian/Aquatic Conservation Strategy

- Stream protection areas (a minimum 25-foot buffer for streams) would be maintained.
- The cut trees would be removed by skyline cable yarding.
- Trees within one tree length of no-cut buffers would be felled directionally away from streams. Where a cut tree does fall within a stream protection area, the portion of the tree within the reserve would remain.
- One-end suspension of logs in skyline yarding areas would be required to minimize soil compaction, damage to reserve trees and disturbance. Yarding corridors would average 150 feet apart and be 15 feet or less in width. Lateral yarding up to 75 feet from the skyline using an energized locking carriage would be required.

Soils/Fuels

- Existing skyline corridors and landings would be used as much as possible.
- In order to avoid damage to existing tree roots, ripping skid roads would not be done. Mitigation would only be in the form of minimizing soil disturbance and compaction by yarding on top of slash as much as possible.
- Larger concentrations of logging slash would be piled along roads with a hydraulic loader. Equipment would not be allowed to operate off of surfaced roads. Piles to be burned would be covered with 6 mil plastic. The piles would be burned later in the fall after significant rainfall has occurred and under favorable smoke management weather conditions. Burning would occur only under conditions which comply with state and federal air quality guidelines.
- In order to mitigate fire risk, this site would be monitored for the need of closing or restricting access during periods of high fire danger. During the closed fire season the first year following harvest activities, while fuels are in the “red needle” stage, the entire area would be posted closed to all off-road motor vehicle use.

Vegetation (excluding 25-foot stream protection areas)

Forest Stand

- An average of 64 trees per acre (range of 50 to 70) with an average spacing of 26 feet between trees (range of 20 to 35 feet) would be reserved. This would leave an average basal area of approximately 140 square feet per acre. These figures include four trees per acre to be reserved for future snag/down wood creation.

- Reserve trees greater than 20 inches diameter breast height (dbh) to be used for tail-trees would not be removed.
- Hardwoods and all conifers, other than Douglas-fir and western hemlock, would be reserved. First priority for removal would be Douglas-fir.
- All existing understory conifers would be reserved to promote second-story development.
- Dominant trees would be mainly reserved, leaving also some codominant and healthy intermediates to provide vertical diversity.
- Where appropriate, western hemlock and western redcedar would be under-planted to promote the development of a second story.
- Logging debris would be allowed to be removed or sold as firewood.
- In accordance with the RMP (pp. 28-33), appropriate measures would be taken to protect special status species or additional SEIS special attention species discovered prior to selling the timber.
- Except for some openings created by density management, a minimum of 40 percent canopy closure would be maintained throughout the harvest area.
- All exposed soil on landing locations would be seeded with Oregon certified (blue tagged) red fescue at a rate equal to 40 pounds per acre. The extent of soil disturbance would be determined in cable yarding corridors at completion of yarding. If warranted for the abatement of any noxious weed infestations, these areas would be seeded.
- Two 2 poplars would be protected in the reserved areas.
- Damage to residual and understory trees would be reduced by requiring all logs to be cut less than 40 feet in length and limbed on 3 sides prior to yarding.
- Skyline yarding would be restricted from March 15 to July 1 to reduce damage to residual trees unless allowed by Authorized Officer.

Survey and Manage Species

- Management of Survey and Manage Species found as a result of inventories would be accomplished in accordance with the *Record of Decision and Standards and Guidelines for Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (S&M ROD, January 2001) and the *Final Supplemental Environmental Impact Statement For Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (S&M FSEIS, November 2000).

This would include the following:

Species Removed from Survey and Manage, Protection Buffers, and Protect From Grazing in All or Part of Their Range (Table 1-2, S&M ROD, January, 2001).

- *Otidea onotica*, *Peltigera collina* and *Antitrichia curtispindula*.

No special management is required.

Category B Species Included in Survey and Manage Standards and Guidelines and Category Assignment (Table 1-1, S&M ROD, January, 2001).

- *Ramaria aurantiisiccescens* site would be protected by reserving all trees and restricting ground-disturbing activity from the project area.

Management of this species would be accomplished as known site as stated on page 9 of the *S&M ROD* and Management Recommendations for Fungi Version 2.0 (Castellano & O'Dell, Sept. 1997). This would mean protecting this site with a minimum 50-foot radius, no-entry buffer.

Wildlife/Fisheries

- Trees with forks, broken tops, large limbs or other characteristics desirable for wildlife would be reserved.
- In accordance with the RMP (pp. 28-33), appropriate measures would be taken to protect special status species or additional SEIS special attention species discovered prior to selling the timber.
- Harvest operations and associated activities would be conducted in conformance with the applicable Biological Opinion (# 1-7-00-F-649) dated October 4, 2000 concerning listed wildlife species. Pertinent "Terms and Conditions" for this BO include:
 - ▶ From April 1 through September 15, restrict daily use of power equipment to the period from two hours after sunrise to two hours before sunset on all project activities that require use of power equipment;
 - ▶ Notify the Resource Area Biologist if any federally listed wildlife species are found occupying stands identified for treatment.
- Management of coarse woody debris (CWD) would include:
 - ▶ existing down logs and snags would be retained except where they pose a safety risk, or affect access and operability. Any snags felled or existing down logs moved for these purposes would remain on site within the project area;
 - ▶ large diameter (greater than 20 inches) green trees that are incidentally felled for yarding corridors or tailholds would remain on site to meet CWD needs;
 - ▶ prior to completion of the termination of the contract, a minimum of 48 trees (about 1 tree per acre) would be killed for snags/down logs, having a dbh greater than or equal to 20 inches (most of these trees are likely to come from corridors or tailhold trees);
 - ▶ within 3 to 5 years after completion of harvest activities, monitoring of harvest and

natural mortality recruitment would determine if 3-5 trees per acre are functioning as hard snags/logs (Class 1 or 2) inclusive of the treatment unit and adjacent 100 meters. If monitoring determines there are less than 3 trees per acre, then additional trees (any species) having a dbh greater than 16 inches would be killed for CWD.

Survey and Manage Species

- Management of Survey and Manage Species found as a result of inventories would be accomplished in accordance with the *Record of Decision and Standards and Guidelines for Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (S&M ROD, January 2001) and the *Final Supplemental Environmental Impact Statement For Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (S&M FSEIS, November 2000).

This would include the following:

Species Removed from Survey and Manage, Protection Buffers, and Protect From Grazing in All or Part of Their Range (Table 1-2, S&M ROD, January, 2001).

- *Prophyaon coeruleum*

No special management is required.

COMPARISON OF ENVIRONMENTAL CONSEQUENCES, BY ALTERNATIVE, FOR IDENTIFIED ISSUES

Issue	Alternative 1	Alternative 2	Alternative 3
Vegetation	<p>Reduces stand density from 130 trees per acre (TPA) to 64 TPA.</p> <p>Increase the amount of light penetrating the canopy. Increased light levels would promote growth and development of vegetation found at mid-canopy and ground levels. Understory initiation of shade-tolerant conifers would be promoted in areas of increased light. In the interim, a more complex understory would develop, consisting of more shrub species and planted conifers.</p> <p>Residual trees would increase in diameter and crown depth/width. Limb diameter on large limby trees would be maintained by releasing those trees to an open grown condition. The long-term results of density management would be larger average diameter breast height (DBH), and larger crowns (higher crown ratios) at any given age</p>	<p>Reduces stand density the same as alternative 1 and opening up the canopy would cause the same ground level micro-climatic changes as outlined in Alternative 1 above.</p> <p>Retention of large amounts of dead wood on the ground would immediately increase the risk of fire as well as the rate of spread and resistance to control.</p> <p>Douglas-fir bark beetles are attracted to freshly killed Douglas-fir trees over approximately 12 inches in diameter. If all cut trees were to remain within the proposed project area, a high risk of infestation could occur, resulting in the mortality of a large number of green trees.</p>	<p>Stands needing treatment would not occur. Time frame for Riparian Reserves to attain late-successional forest characteristics would lengthen (average snag/CWD DBH's would be 38% larger than no-treatment alternative). Opportunities to enhance structural development would not occur.</p>

Issue	Alternative 1	Alternative 2	Alternative 3
Soils	Residual compaction within RMP standards.	No significant change since yarding would not occur. Some compaction would occur during the falling operation.	Continuation of current conditions.
Water/Riparian/ Fish	<p>No measurable affect on physical integrity, water quality, sediment regime or in-stream flows. Short-term, variable increase in stream turbidity may occur.</p> <p>Riparian zone protected by 25 ft. no-entry buffer. Enhance structural and species diversity, restore riparian ecosystem functions.</p> <p>No adverse impacts to fish or fish habitat anticipated.</p>	<p>Same as Alt. 1 only with reduced sediment input potential by eliminating yarding on timber.</p> <p>Same as Alt. 1 except additional CWD left on site.</p> <p>Short-term minor sediment input. No measurable adverse impacts to fish anticipated.</p>	<p>Continuation of current conditions and trends.</p> <p>Single canopy stands lacking structure and species diversity. May take 45 years to attain understory.</p> <p>No sediment input. No effects to resident fish. No effects to aquatic ecosystem.</p>
Wildlife	<p>Species mix in harvest areas would not change due to this action. No effect on older forest species.</p> <p>Enhances habitat for mollusks, amphibians, insects, rodents, etc.</p>	<p>Leaving large numbers of relatively large trees on the ground would affect access by large mammals such as deer and elk which would need to travel through Riparian Reserves to reach streams.</p> <p>Enhances habitat for mollusks, amphibians, insects, rodents, etc.</p>	Continuation of current habitat conditions and trends.

III. DESCRIPTION OF THE AFFECTED ENVIRONMENT/ ENVIRONMENTAL CONSEQUENCES

The following descriptions are the environmental features affected by timber harvest and associated activities. A documentation of no affect to resources where review is required by statue, regulation, or executive order is included in Appendix B. See BLM Manual, Sec. 1790, Appendix 5. Resource values are not described in this section if there are no anticipated site-specific impacts, site-specific impacts are considered negligible, or the cumulative impacts described in the existing EIS are considered adequate.

A. GENERAL

The proposed project area is located in Section 8, T. 15 S., R. 6 W., W. M., in Benton County. The project area is in the South Fork Alsea Watershed. The land use allocation for the project area is Riparian Reserve.

B. TOPOGRAPHY

The project area is situated primarily on a mid-slope with no distinctive aspect. Elevation varies from 1,100 to 1,400 feet. Slopes range from 30 to 70 percent.

C. VEGETATION

Issue: Effects on native vegetation and special status/SEIS special attention species and habitats and noxious weeds.

Vegetation: Affected Environment

Except for scattered openings containing big-leaf maple and red alder, the stands predominately contain a single canopy layer of Douglas-fir. The understory ranges from sparse vegetation to pockets of very heavy salal, Oregon grape or sword fern, depending on the amount of light reaching the ground. There are few understory conifers in these stands due to lack of light and heavy brush. Three large remnant old-growth trees occur in the density management area. Hardwoods are scattered through the stands but are mainly found along the larger streams. Specific stand data are summarized in table 1.

Table 1

SPECIFIC STAND DATA

Acres	Timber Type	Site Index	Av. Ht	Basal Area	Crown Closure	Elev	Aspect	Slope	TPCC
50	D3-- 1940	126	114	171	78	1100- 1400	SW	30-70	* RMR1

* These sites are subject to long dry seasons and to rapid air temperature increases during spring while soil temperatures are low.

Data derived from forest surveys (1999).

The plant association in the project area is *Douglas-fir/red alder/salmonberry* plant grouping which occurs on the west slopes of the Oregon Coastal Mountains. More specifically, the areas are dominated by a mosaic of the following plant associations:

The *western hemlock/salmonberry* plant association occurs on middle and lower slopes on moist sites.

The *western hemlock/salal* plant association is common on upper slopes and ridges.

The *western hemlock/sword-fern* plant association is common throughout the forest. It occurs on steep and lower slopes or, less often, on benches and alluvial flats.

The *western hemlock/vine maple/sword-western fern* plant association is most common on relatively warm, well-drained middle and lower slopes.

Phellinus weirri (root-rot) occurs in the project area, where it has created scattered openings less than 0.25 acre in size.

Survey and Manage

Vascular plants

Inventory of the project area for survey and manage vascular plant species was accomplished in accordance with the survey protocols as described on page 3 of survey Protocols for survey and Manage strategy 2 Vascular Plants, version 2.0, December 1998. Specific surveys for all listed special status and special attention vascular plant species were accomplished on July 15th and 21st, November 4th and 17th and December 2nd, 1999. A list of all species looked for with the proposed project area is attached.

Special Status Species: There are no “known sites” of any special status vascular plant species within the project area.

Special Attention Species: There are no “known sites” of any special status vascular plant species within the project area.

Lichens:

Inventory of the project area for survey and manage lichens were accomplished in accordance with the survey protocols as described within the Survey Protocols for Component 2 Lichens version 2.0, March 12, 1998. Inventories for newly assigned lichen species into categories "A" and "C" of the Record of Decision and Standards and Guidelines for amendments to the Survey and Manage, Protection buffer, and other Mitigation Measures Standards and Guidelines (S& M ROD) that currently have no protocols were surveyed using the intuitive control method. However, pre-disturbance surveys for these species may not be required for up to two years as described on page 23 of the S&M ROD. Specific surveys for all listed special status and special attention lichen species were accomplished on July 15th and 21st, November 4th and 17th and December 2nd, 1999.

Special Status Species: There are no “known sites” of any special status lichen species within the project area.

Special Attention Species: *Peltigera collina* was found within the proposed project area. This species was previous Northwest Forest Plan special attention lichen species and was included in

Table 1-2, Species Removed from Survey and Manage, Protection Buffers and Protect From Grazing in all of Part of Their Range, page 53, S&M ROD.

Bryophytes

Inventory of the project area for survey and manage bryophytes was accomplished in accordance with the survey protocols as described in Survey Protocols For Survey and Manage Component 2 Bryophytes, version 2.0, December 1997 and Survey Protocols for Protection Buffer Bryophytes, version 2.0, December 1999. Specific surveys for all listed special status and special attention bryophyte species were accomplished on July 15th and 21st, November 4th and 17th and December 2nd, 1999.

Special Status Species: There are no “known sites” of any special status bryophyte species within the project area.

Special Attention Species: *Antitrichia curtispindula*, a Northwest Forest Plan special attention bryophyte species was found in several locations within the proposed project area. It is included in Table 1-2, Species Removed from Survey and Manage, Protection Buffers, and Protect From Grazing in all of Part of Their Range, page 53, S&M ROD.

Fungi

Inventory of the project area for survey and manage fungi species was accomplished in accordance with the survey protocols as described in Survey Protocols for (*Bridgeoporus nobilissimus*) Fungi, version 2.0, May 1998 and Survey Protocol for *Bondarzewia mesenterica* (= *B. montana*), *Otidea leporina*, *O. onotica*, *O. smithii*, *Polyzellus multiplex*, *Sarcosoma mexicana*, and *Sowerbyella* (= *Aleuria*) *rhenana*, version 1.3, December 1999. Specific surveys for all listed special status and special attention fungi species were accomplished on November 4th and 17th and December 2nd 1999.

Special Status Species: There are no “known sites” of any special status fungus species within the project area.

Special Attention Species: The following special attentions species were found during surveys, *Otidea onotica* a category F species and *Ramaria aurantiisiccescens* a category B species was found in the project area. Surveys were conducted in July, November and December of 1999.

Noxious Weeds: Noxious weeds known to occur within the area are tansy ragwort (*Senecio jacobaea*), bull and Canadian thistles (*Cirsium vulgare* and *C. arvense*), and St. Johns wort (*Hypericum perforatum*). Noxious weed populations are considered low at the present time.

Coarse Woody Debris (CWD)

The RRTRU (May 2000) recommends density management projects in Riparian Reserves within fast growing stands with relative densities over 0.35 to maintain fast growth of dominant trees (p. 8). Prescriptions would be determined on a site-specific basis and may include uneven spacings, a range of densities, small patch cuts, small unthinned patches, and opening up specific trees to encourage wolfy limbs. Where appropriate, trees may be cut and left in adjacent streams to provide structure, cover, and support a diverse aquatic habitat. Maintain minor species and trees with desirable wildlife characteristics, including hardwoods. Leave enough green trees to ensure snag and CWD

recruitment. Remove merchantable material in excess of snag and CWD requirements (as determined by the ID team) where it poses a forest health hazard (excess fuel loading, Douglas-fir bark beetle or black stain infestation). Prescriptions should include all subsequent treatments to maintain understory growth, achieve snag/CWD goals, achieve older forest characteristics, or any other identified goals, as well as underplanting and subsequent density management to maintain understory growth. It also recommends leaving the minimum levels of CWD recommended by the *Late-Successional Reserve Assessment, Oregon Coast Province-Southern Portion* (LSRA, June 1997), plus 3 to 5 hard logs over 12" per acre. As Table 2 indicates, although the proposed action meet Late Successional Reserve Assessment cubic foot CWD requirements, it lacks down wood in decay classes 1 and 2 snags are smaller than recommended.

Table 2

Coarse Woody Debris data

CWD (cu. Ft/acre) ¹ greater than 8' long and 5" DBH	CWD Decay Class 1-2 (pieces/acre greater than 8' long and 12" DBH)	CWD Decay Class 3-5 (pieces/acre greater than 8' long and 12"DBH)	SNAGS Decay Class 1-2 Snags per acre / average DBH	SNAGS Decay Class 3-5 Snags per acre/ Average DBH
1274	0	34.8	30.3/6.4"	4.0/15.2"

1. Using strategy #3 described in the *LSRA*, required short-term CWD minimums from Table 12 (p. 61) range between 525 and 2,844 cubic feet.

* Data was derived from Forest Survey (1999).

Vegetation: Environmental Consequences

Alternative 1 (Proposed Action)

The proposed action would increase the amount of light penetrating the canopy. Increased light levels would promote growth and development of vegetation found at mid-canopy and ground levels. It is expected that over the long-term, understory initiation of shade-tolerant conifers associated with canopy layering would be promoted in areas of increased light. In the interim, a more complex understory would develop, consisting of more shrub species and planted conifers.

Residual trees would increase in diameter and crown depth/width. Limb diameter on large limby trees would be maintained by releasing those trees to an open grown condition. The long-term results of density management would be larger average diameter breast height (DBH), and larger crowns (higher crown ratios) at any given age, compared to the no treatment option. As table 3 indicates, diameters 45 years into the future in the treated stands are predicted to range from 17 percent to 21 percent larger, and crown ratios would range from 14 percent to 23 percent higher.

Desirable snag and CWD characteristics would be enhanced in 2 ways:

1. Residual trees would reach an average 20 inches DBH 15 to 30 years sooner, compared to the no treatment alternative and therefore meet the desired large diameter characteristics for snags and coarse woody debris (CWD) more quickly. Snags and CWD

could then be created from these larger trees. Additionally, trees smaller than stand average, and consequently at a higher risk of mortality, would reach an average 20 inches DBH more quickly, compared to the no treatment option, creating additional opportunities for future larger snag/CWD formation. Average snag/CWD DBHs in table 3 are 38-39 percent larger than in the no treatment alternative.

2. Coarse woody debris and snag enhancement would be created with some short-term CWD and snags. Post-harvest monitoring would evaluate the size and condition of snags and CWD. Creation of CWD would come from harvest activities, post-harvest windthrow, and beetle kill. Monitoring would be done three years after the harvest, a point at which opportunities for natural creation of CWD and snags should have been maximized. After monitoring, the appropriate number of trees would be cut and left where needed to supply hard CWD. Snags would be created where needed. Long-term CWD and snag enhancement would be created by reserving green trees to maximize long-term quantities and sizes of CWD and snags.

Survey and Manage Species

Lichens

Special Attention Species:

None of the *Peltigera collina* sites would receive any special protection from the thinning operations. This species is fairly common within the range of the Forest Plan. Some of these known sites may be destroyed if the host tree is severed or damaged and dies. Future wind-throw may also remove some of the host trees resulting in the removal of some of the existing known sites. However, thinning and increasing sunlight to the stand may result in a net increase in the habitat for several of these lichen species.

Bryophytes

Special Attention Species:

None of the *Antitrichia curtispindula* sites would receive any special protection from the thinning operations. Some of these known sites within the project area may be destroyed if the host tree is severed or damaged and dies. Future wind-throw may also remove some of the host trees resulting in the removal of some of the existing known sites.

Fungi

Special Attention Species:

All of the category F *Otidea onotica* species known sites would not receive any special protection from the thinning operations. This species is common throughout most of the contract area including other fungi buffers and riparian reserves. There were only 7 known sites of this species at the implementation of the Forest Plan and currently there are over 210 known sites within the Salem District, Marys Peak Resource Area. Most of these known sites are located in younger aged forests. Some of these known sites within the thinning area may be destroyed from logging operations.

The *Ramaria aurantiisiccescens* site was withdrawn from thinning consideration and is included in a riparian buffer reserve.

Noxious Weeds:

The species present are priority III noxious weeds and are well established and widespread throughout the Mary's Peak Resource Area and the Salem District. Eradication is not practical using any proposed treatment methods other than biological control. Grass seeding exposed soil areas tends to decrease the establishment of noxious weeds. There is no additional road to be constructed with this project and any adverse effects from noxious weeds are not anticipated.

Table 3

COMPARISON OF TREATMENT VS. NO TREATMENT 45 YEARS IN THE FUTURE¹

Approx. Acres		Age	RD ²	QMD ³	Trees/Acre	Crown Ratio	Cum. Mortality/Acre ⁴	Av. Snag/CWD DBH ⁵
50	Original Stand	60	.57	16.7	130	.38		
	Proposed Treatment	60	.37	20.8	60	.46		
	No Treatment	105	.69	21.7	103	.24	26.9	12.1
	With Treatment	105	.53	26.3	58	.31	5.6	19.6

1. In order to compare results of the proposed treatments versus no treatment, the stands were modeled using ORGANON, SMC v.1.0, a growth and yield model developed by OSU. Numbers generated by growth and yield models can be used as a relative comparison of treatments in a given stand but are not necessarily accurate predictions of future growth. Future stand measurements are dependent on disturbance patterns and other stochastic events which can never be accurately predicted.
2. RD (relative density) is a ratio: trees per acre in a stand adjusted to a 10 inch diameter, divided by the number of trees per acre in a fully stocked stand 10 inches in diameter (595 for DF). 0.35 is the point where growth slows from competition. 0.6 is the point where competition begins to cause mortality.
3. QMD = quadratic mean diameter, the DBH of the tree of mean basal area in a stand.
4. Model runs did not include trees reserved for future snag/CWD creation.
5. Includes trees reserved for future snag/CWD creation and assumes they would equal or exceed average stand diameter.

Thinning would increase wind firmness of the stands by strengthening root systems, increasing diameter to height ratios, and increasing live crown ratios, which lowers the trees' centers of crown mass.

There would be a small short-term, elevated risk of Douglas-fir bark beetle infestation in healthy standing trees due to windthrow, and logging damage to residual trees. Bark beetle infestation risk may be minimized by following the guidelines developed for the Siuslaw National Forest (Appendix E). Reducing competition would increase the vigor of individual trees left, presumably making them able to resist bark beetle attack better.

Alternative 2 - (Density Management without Harvest)

The effects to the overall stand would be the same as Alternative 1 except there would be a significant increase of CWD in decay class 1.

Douglas-fir bark beetles are attracted to freshly killed Douglas-fir trees over approximately 12 inches in diameter. It has been observed that disturbances which produce large numbers of dead trees can cause a population increase of bark beetles and result in infestation of adjacent healthy trees. If all cut trees were to remain within the proposed project area, a high risk of infestation could occur, resulting in the mortality of a large number of green trees. Removal of the cut trees would likely greatly reduce this risk. (see Appendix E)

Alternative 3 (No Action)

The canopy would remain “closed,” limiting the amount of available sunlight to the understory and ground cover. The ground cover would remain sparse until co-dominant and suppressed trees begin to die, creating additional down woody material and opening the canopy. Small infestations of the Douglas-fir bark beetle may become established in the dying trees. This would increase the light level in the stand, thus increasing ground cover and shrub growth and creating vertical structure over time. The relative density (RD) of the stand as modeled on Organon, SMC version 1.0 would be .69 if left untreated for 45 years, whereby 0.6 is considered the RD where mortality due to competition begins. Therefore it can be concluded that no significant understory would develop within the next 45 years without density management. Secondary growth of the conifers would remain low as compared to stands that are more open and/or less stocked. All SEIS special attention species would be protected, and noxious weed populations in the area would remain low. Nutrients would not be removed from the site. Blow-down trees could occur in winter storms creating habitat for the Douglas-fir bark beetle. Open, slash-covered areas could become dominated by shrubs and/or ferns.

This alternative would not effect any special status vascular plant, bryophyte or lichen species since none were found or are known from this project area.

D. SOILS/FUELS

Issue: Effects on long term-site productivity as related to soil compaction. Effects on fuel loading and fire hazard.

Soils/Fuels: Affected Environment

Soils

The predominant soil series on and around these sites are Bohannon gravelly loam and Klickitat gravelly clay loam. Slopes on the majority of the sites vary from 20 to 50 percent. Moderately compacted soils have persisted in many of the existing skid trails that date back to the original logging of the site around 1940.

Bohannon soils are well-drained, moderately deep soils that formed in colluvium weathered from sandstone. They are found on Coast Range sites at elevations from 1,000 to 3,500 feet. Slopes range from 25 to 75 percent. Typically, the surface soil is a very dark-brown and dark brown gravelly loam about 18 inches thick. The sub-soil is a dark brown gravelly loam about 17 inches

thick. It is underlain by sandstone bedrock at a depth of about 35 inches.

Klickitat soils are well-drained, gently sloping to extremely steep soils formed in alluvial and colluvial materials derived from basalt. They are found on Coast Range sites at elevations of 500 to 4,000 feet. Typically the surface layer is a dark reddish-brown gravelly clay loam about 8 inches thick. The sub-surface soil is a reddish-brown very gravelly clay loam about 20 inches thick grading to a sub-soil of dark-brown very gravelly loam about 18 inches thick. Fractured basalt is at a depth of about 45 inches.

The slopes and soils on this proposed project area are generally stable with moderately high to high site productivity. Vegetation re-establishes fairly rapidly following disturbance.

There are two management concerns with these soils: the potential for compaction and the potential for surface erosion. Due to the substantial amount of clay and silt-sized particles in these soils, they easily compact when they are moist or wet and subjected to pressure from heavy equipment, dragging logs, etc. Once compacted there would be a subsequent reduction in the water infiltration rate. On compacted steeper sites (greater than 35 percent), run-off rates on bare soil could be rapid and hazard of erosion moderate to high. Much of the proposed project site has slopes between 30 and 50 percent. Minimizing compaction of soils and maintaining some vegetation and litter on the surface of the steeper areas would be accomplished by requiring one-end suspension during yarding. Compaction of the soil also can reduce site productivity by limiting and/or restricting root growth in the compacted soil as well as limiting movement of O₂, CO₂ and H₂O into and out of the soil.

Fuels

The project area is presently occupied by fairly continuous stands of second growth Douglas fir timber with varying minor components of western hemlock, Western red cedar, bigleaf maple and red alder trees. Undergrowth is a moderate growth of: salal, Oregon grape, vine maple, ocean spray and huckleberry. There is a moderate accumulation of dead woody material on the ground. Small snags are scattered through the stand. Large snags (over 20" dia.) are less than 2 per acre. Based on visual estimates, the estimated total dead fuel loading for these stands is in the 15-20 tons per acre range. Fuel model for these sites would be model 8 - closed timber litter.

The sale area is located outside the Oregon Smoke Management designated area. These areas are designated as areas where the amount of particulate matter from smoke below 3000 feet altitude is restricted on a daily basis. The sale area is located approximately 7 air miles from the designated area.

Soils/Fuels: Environmental Consequences

Alternative 1 (Proposed Action)

Soils

Under this proposal, the percentage of total unit area impacted by surface disturbance and soil compaction as a result of additional landing construction would be less than 0.6 percent (approximately 0.3 ac.) and from skyline yarding roads 4 percent (approximately 1.9 ac.). The total area affected would be approximately 4.6 percent.

Some of the soil compaction listed above was compacted in previous entries. The area between the proposed unit and the existing gravel roads was thinned in 1996-98. The skyline yarding roads would simply be extended into the un-thinned timber below. Since the previously created skyline yarding corridors would be used as much as practical to yard logs for this project the actual amount (acreage) of new disturbance and compaction would be less than the totals listed above.

Soil impacted by skyline yarding roads usually results in light to moderate compaction in a narrow strip less than 4 feet in width. This is especially true for this type of project where logs are relatively small and adequate slash is on the ground in the corridors to yard over. The effect on site productivity from this type of disturbance is minimal compared to severely compacted tractor or haul roads. By following the design measures, only light to moderate soil compaction and very little or no top soil loss should occur. Expected productivity losses would be negligible for the skyline yarded area.

Fuels

The increase in slash created by the proposed thinning would result in a higher risk of fire on the thinned sites following logging. The increase in fuel loading is expected to be 5 to 15 tons per acre, with a discontinuous arrangement. Total dead fuel loadings would range from approximately 15 to 35 tons per acre. The highest fuel loadings would be scattered through the site depending on the distribution of trees cut with the various prescriptions. The overall rating of fire intensity following this action would be moderate. This is due to the moderate topography, the isolated nature of the most of the slash from the roads, the continued existence of a tree canopy shading the fuels, and the higher humidity associated with riparian areas. Risk of fire would be greatest during the period when attached needles dry out the first season following cutting. These “red needles” generally fall off within one year and fire risk greatly diminishes. Fire risk would continue to diminish as the area greens up and the fine twigs and branches begin to break down. Burning of landing piles and slash concentrations along roads would reduce risk of a fire start from human ignition sources.

Burning of piles would be done in the fall under good atmospheric mixing conditions so the threat of impacting air quality in designated areas would be very low. Any residual smoke should be of short duration and occur during a period of the year when there is less outdoor activity.

Alternative 2 (Density Management Without the Harvest)

Retention of large amounts of dead wood on the ground would immediately increase the risk of fire as well as the rate of spread and resistance to control. The risk of a fire and the rate of its spread would be highest during the first one to two years following cutting when there is a large amount of fine fuel in a surface and aerial arrangement, and then would drop significantly and return to pre-treatment risk levels over the next 20 to 40 years. The resistance to control determined by the amount and size of fuels would remain significantly higher than normal for 15 to 25 years. On average, after about 20 years, thinning-size material begins to break down rapidly to duff material which still poses a slightly higher than normal risk of a fire start, as well as resistance to control. A high loading of surface fuels would increase the likelihood of fire spreading upward into the canopy and up into snags, further increasing the difficulty of controlling a wildfire. Consequently, desired structural characteristics such as snags and multi-layered canopies would be at a greater risk of loss.

Alternative 3 (No Action)

No action would result in the continuation of current growth conditions at this site.

E. WATER/RIPARIAN

Issue: Effects on stream flow, channel conditions, and water quality and aquatic conservation strategy objectives.

Water/Riparian: Affected Environment

The primary stream draining the project area is the South Fork Alsea River. The project area is contained in the upper South Fork Alsea watershed which is approximately 9,500 acres or 14.8 square miles in drainage area.

The project area is on a small tributary channel to the South Fork Alsea River. The main stream in the area proposed for treatment is a perennial Rosgen type “A” channel: greater than 4 percent gradient, entrenched in a narrow valley with moderate to steep adjacent hillslopes. The channel here has no floodplain and features step-pool morphology formed from large wood interspersed with cascading sections. Channel substrates are gravels to small cobbles. Small intermittent tributaries to the main channel are Rosgen “Aa+” types: greater than 10 percent gradient, formed on the surface of colluvial hillslopes and prone to debris torrents. All of the channels in the project area appear to be functioning within the range of conditions that existed prior to human disturbance.

Water Quality and Beneficial Uses

There is no quantitative data concerning suspended sediment transport and/or turbidity for the stream in the project area although some data for the upper South Fork Alsea are available. The data that have been collected imply that fine sediment levels in stream substrates and those transported as suspended sediment during winter storm events are within the range of natural variability for this watershed. It should be noted that the upper South Fork Alsea watershed has large stretches of low gradient, alluvial channel with active beaver populations. These conditions are conducive to the capture, storage and transport, particularly during storm events, of high concentrations of fine sediment.

Although data indicate that fine sediment supply and transport are within the range of natural variability in this watershed, sampling to date has been infrequent. Currently there are not enough sediment data in the watershed to provide a reliable representation of water quality conditions. In addition, other observations of channel and hillslope conditions suggest that fine sediment supply and transport in the watershed may be high. In response to these concerns, physical and biological monitoring in the upper South Fork Alsea channel is ongoing.

Stream Temperature

Continuous stream temperature measurements and macroinvertebrate samples were collected at two sites on the upper South Fork Alsea main channel as well as on lower Coleman and Fall creeks in the summer of 1999.

Stream temperatures were above the state standard of 17.8 C° at the upper South Fork Alsea site for

several days during the summer. Temperatures showed a slight cooling trend at the lower Alsea site below the project area but were still above standard during the hottest part of the summer. Both Coleman Creek and Fall Creek maintained summer stream temperatures well below the state standard, with 7-day averages of 15.0 C° and 13.6 C° respectively.

Due to the simplified and widened main channel on the upper South Fork Alsea, riparian vegetation is less effective at providing shade. In addition, portions of the upper South Fork Alsea flow through open meadow settings and are exposed to direct sunlight for much of the day during summer. In response to the high concentration of low gradient, open channel reaches in this watershed, it is likely that ambient summer stream temperatures have always been higher relative to other coast range streams.

Current stream-side vegetation on tributary channels in this area is adequate to shade surface waters during summer base flow. Implementation of the Northwest Forest Plan would maintain these temperatures on public lands in the watershed.

Oregon Department of Environmental Quality’s (DEQ) *1998 303d List of Water Quality Limited Streams* is a compilation of streams which do not meet the state’s water quality standards. Neither the South Fork Alsea or its tributaries are listed in the report. However, the Alsea River is listed as not meeting water quality standards for summer stream temperatures from the mouth to headwaters.

The DEQ has also published an assessment, the 319 Report, which identifies streams with potential non-point water pollution problems (*1988 Oregon Statewide Assessment of Nonpoint Sources of Water Pollution*). The upper South Fork Alsea and its tributaries were identified as either having no problem or lacking data (the report does not discriminate between no problem and no data).

Beneficial uses of surface water from the project area are displayed in table 4. There are no known municipal or domestic water users in the project area. Irrigation and livestock watering occur in the Alsea Valley, near the town of Alsea, approximately 5 miles downstream from the project area. Additional beneficial uses of the stream-flow in the project area include resident fish, recreation, and esthetic values.

Table 4

BENEFICIAL USES ASSOCIATED WITH STREAMS IN THE PROJECT AREA

Stream (Watershed)	Project Action	Beneficial Use	Distance from Project Action	Information Source
South Fork Alsea	Timber harvest, density management	Anadromous fish	3.5 miles	BLM
		Resident fish	Immediate	BLM
		Domestic use	greater than 10 miles	WRIS*
		Irrigation/live-stock watering	5 miles	WRIS*

* WRIS = *Water Rights Information System* of the Oregon Department of Water Resources

Water/Riparian: Environmental Consequences

(Reference Appendix C, Aquatic Conservation Strategy Objectives Summary)

Alternative 1 (Proposed Action)

Measurable effects to stream flow, channel morphology, and water quality as a result of this proposed action are unlikely. This action is unlikely to alter the current condition of the aquatic system either by affecting its physical integrity, water quality, sediment regime or in-stream flows.

This proposal is unlikely to substantially alter stream flow or peak flow events. Tree removal would not occur on steep, unstable slopes where the potential for mass wasting adjacent to stream reaches is high. Therefore, increases in sediment delivery to streams due to mass wasting are unlikely to result from this action. In addition, potential impacts resulting from tree harvest and road construction would be mitigated and, with the implementation of BMPs, are unlikely to contribute measurable amounts of sediment to streams. Although thinned, substantial portions of the riparian canopy would be retained, therefore maintaining riparian microclimate conditions and protecting streams from increases in temperature.

In conclusion, this proposal is unlikely to impede and/or prevent attainment of the stream flow and basin hydrology, channel function, or water quality objectives of the Aquatic Conservation Strategy (ACS). Over the long-term, this proposal should aid in meeting ACS objectives by speeding the development of older forest characteristics in the riparian zone.

Streamflow

Alterations in the capture, infiltration and routing (both surface and subsurface) of precipitation as a consequence of the mechanical removal of trees and reductions in stand density have been documented on watersheds in the Pacific Northwest and other parts of the world. However, the actions reviewed under this proposal would affect less than 1 percent of the forest cover in the South Fork Alsea watershed. Detectable direct or indirect effects to streamflow as a result of this action are unlikely. However, this action was analyzed for its potential contribution to cumulative effects to streamflow in this watershed.

Water Quality

Best management practices and mitigation measures are proposed to eliminate and/or limit acceleration of sediment delivery to streams in the project area.

Riparian “No-treatment Zones”

For the protection of stream channels and aquatic resources, buffers or “no-treatment zones” were applied to all stream channels in the project area. These zones were determined in the field by BLM personnel following a protocol developed by the area hydrologist, biologists and riparian ecologist. The protocol required a minimum twenty-five-foot “no treatment” zone. This zone could be extended upslope, during field surveys, as far as deemed necessary to protect aquatic resources. This determination was based on site features such as slope breaks, slope stability, water tables, etc. (see

Appendix F). Additionally, no treatments in riparian areas are proposed unless stand densities and composition clearly indicate the need (see RRTRU for a discussion of criteria and treatment objectives).

Timber hauling

The main haul routes would be on rocked roads to the South Fork Alsea Access Road, which is paved. Timber hauling during periods when water is flowing on roads and into ditches could potentially increase stream turbidity if flows from ditches are large enough to enter streams. If a problem develops, corrective measures would be implemented during contract administration.

Tree harvest and yarding

Yarding corridors, if sufficiently compacted, may route surface water and sediment into streams. However, several factors limit the potential for this to occur: 1) even if compacted, high levels of residual slash on yarding corridors would contribute to reducing the accumulation of runoff by deflecting and redistributing overland flow laterally to areas where it would infiltrate into the soil; 2) gentle gradients in this project area provide little opportunity for surface water to flow; 3) no-treatment zones in riparian areas have high surface roughness which functions to trap any overland flow and sediment before reaching streams; and 4) the small size of trees being yarded would limit surface disturbance to minimal levels.

Stream Temperature

Shading along all the tributaries in the project area is currently adequate, and this proposal would not substantially alter stream side shading here. Riparian “no-treatment” zones were specifically placed to protect portions of the channel where forest shade is a factor in maintenance of the current stream temperature regime. Overall, this proposal is unlikely to have any measurable effect on stream temperatures in this watershed. The SFAWA (Map 9) indicates low stream temperature risk for the project area.

Channel Stability and Function

Channels in the project area appear to be stable and functional. In the short-term, this proposal is unlikely to alter the current condition of channels in the project area. Minimization of disturbances from the proposed project (e.g., increased flows or sediment delivery) is likely to result in the maintenance of stream channels in their current condition.

Over the long-term, reductions in stand density would likely increase riparian forest health and tree size. This would lead to increased large wood recruitment for stream channels, an important factor in proper channel function. In addition, more open stands would allow for the growth of important riparian species in the understory, such as western redcedar, which are currently suppressed. In the upper South Fork Alsea River, large wood structure in the channel is particularly important because it has been depleted to levels far below its natural range. Large wood in the channel would ultimately slow stream velocity, increase retention of organic material, capture bedload, and improve aquatic habitat as well as conditions for beaver.

Cumulative Effects

A “Level 1” analysis of the risk for cumulative effects to hydrologic processes, channel conditions and water quality for the upper South Fork Alsea watershed was conducted utilizing the *Salem District Watershed Cumulative Effects Analysis Procedure, FY1994*. The following conditions were observed:

* The upper South Fork Alsea covers approximately 12,000 acres of which 3,500 (30 percent) are private land while the remaining 8,500 (70 percent) are managed by the BLM. 460 acres (2 percent) of the upper SF Alsea watershed is “open” (consisting primarily of recent clear-cuts less than 10 years in age) while closed stands of conifer and deciduous species cover 11,540 acres (98 percent) of the watershed.

* Most of the private forest stands in the watershed are old enough to be thinned or clear-cut harvested (greater than 40 years in age) within the next 10 years. Approximately 400 acres of public land is available for regeneration harvest within the next 10 years; 3,500 acres are available for commercial thinning or stand density management (in LSRs and Riparian R).

* The transient snow zone (TSZ) comprises approximately 40 percent (4800 acres) of the watershed.

* There are approximately 104 miles of road for a road density of 5.5 miles/mi². 120 stream crossings potentially result in a stream extension of 12 miles (10 percent increase in channel lengths) during large storm flow events.

The Level 1 analysis indicates that, when past activities together with likely near-term management activities are considered, a moderate risk level exists for cumulative effects to water quality, channel conditions and hydrologic conditions in the upper South Fork Alsea. As a result, a more intensive analysis was conducted to further define risk levels.

Level 1 and level 2 analyses for increases in peak flow and risks to aquatic resources were conducted using the Washington State DNR watershed analysis methods (Washington Forest Practice Board 1997). Details of the analysis are contained in a supplemental report (*Cumulative Effects Analysis for the Upper South Fork Alsea Watershed*).

In summary, the analysis found a low sensitivity to increases in peak flows and low potential risks for aquatic resources for normal storm events. It found an “indeterminate” risk for “unusual” peak flow events associated with a 2-yr return interval. This led to a level 2 analysis to provide greater precision. The level 2 analysis (Bed Mobility Analysis) indicated a “low” risk for effects to channel substrate as a result of the worst scenario estimated in the level 1 analysis. Therefore, it was concluded that potential cumulative effects leading to increases in peak flows, under this proposal in conjunction with other likely actions in the watershed, are low.

Table 5 is a summary of the potential cumulative effects (CE) to watershed and aquatic resources that are expected under this proposal in combination with past actions and likely future actions on public and private lands in the watershed.

Table 5. Upper South Fork Alsea: Current Condition and Cumulative Effects Trends for Watershed and Aquatic Resources.

Attribute	Current Condition (2000)	Projected activities on public lands (through 2010)	Projected activities on private lands (through 2010)	Combined public and private (through 2010)
WAR Rating ¹	Low	Indeterminate	Low	Indeterminate
Bed Mobility ²	Low	Low	Low	Low
Coarse Sediment Supply ³	High in tributaries, low in main channel and from hillslopes	Short-term: no change Long-term: increased main channel retention	Small increase	Small short-term increase
Fine Sediment Supply ⁴	High in-channel storage; roads (unknown)	Short-term: slight increase Long-term: increased main channel retention	Small increase due to logging activity	Small increase over the next decade due to logging activity/road use
Riparian large wood recruitment potential ⁵	Moderate to poor	Short-term: no change Long-term: increased potential	Decrease	Increase: bulk of riparian is on public where LW potential is increasing
Road Density	5.5 mi/sq-mi	Slight decrease	Increase	Increase as forest management increases
Aquatic habitat: Pools/cover ⁶	Good to fair in tributaries, poor in lower mainstem	Short-term: no change Long-term: improvements	Slight reduction in pool depth/quality	Maintain or increase pool quality and depth
Water quality: stream temperature ⁷	Meets state standards in tributaries, below standard in lower mainstem	Short-term: no change Long-term: improvements	Short-term: no change Long-term: improvements	Short-term: no change Long-term: improvements

WAR Rating¹- preliminary analysis based on Washington State DNR watershed assessment methods, from hydrologic conditions module (Washington Forest Practice Board 1997). WAR (water available for runoff) estimates the percentage increase in WAR during a large rain-on-snow event (e.g. 1996 event) relative to a fully mature canopy. less than 10 percent increase results in a sensitivity rating of LOW while a greater than 10 percent increase is indeterminate and requires a level 2 analysis.

Bed Mobility² - a level 2 analysis for watersheds with indeterminate sensitivity ratings from the Washington State DNR watershed assessment methods. Estimates the probability of bed scour assuming increases in peak flows calculated in WAR. Ratings are LOW, MODERATE or HIGH.

Coarse sediment supply³ - supply of sediment greater than 2 mm (gravel, cobble, boulder) to stream channels. From SFAWA, aerial photo review, and field review. Likely sources are mass wasting from steep hillslopes and storage in alluvial terraces and in-channel.

Fine sediment supply⁴- supply of sediment less than 2 mm (sands and silts) to stream channels. From SF Alsea WSA, aerial photo review, and field review. Likely sources are storage sites in terraces and channels, road surfaces, and upland

erosion (mass wasting and overland flow).

Riparian large wood recruitment potential⁵ - Potential for large wood (greater than 24 inches dbh) to enter stream channels from adjacent riparian. From SF Alsea WSA, habitat surveys and field review. Assumes increased recruitment over the long-term (50 years plus) on public lands under the current forest plan with decreased potential on private lands under current forest practice regulations.

Aquatic habitat: pools/cover⁶ - From SF Alsea WSA, ODFW habitat surveys and field review. Assumes increased large wood recruitment on public lands would lead to improved pool quantity and quality.

Water quality⁷ - From SF Alsea WSA and field data (BLM).

As outlined in Table 5, the primary potential Cumulative Effects in this watershed, in response to this proposal in combination with other likely actions on public and private over the next decade, is a likely increase in road use and road density which may result in an increase in fine sediment supply (primarily due to construction/renovation and use of roads). However, these effects are almost exclusively a result of harvest activities on private lands that are expected to occur during the next decade (in fact, several large harvest operations on private lands in the watershed occurred in the summer of 1998).

The risk of this proposal for contributing to cumulative effects to hydrologic processes or water quality in these watersheds is low. To the extent that this proposal would influence overall watershed condition, it potentially could result in short-term, local increases in stream turbidity during hauling (e.g., would only occur during and immediately after hauling and is not likely to be visible or measurable downstream from the project area). Since large woody debris (LWD) and pool habitat are “at risk” in these streams (see South Fork Alsea Watershed Analysis, Appendix 15), long-term LWD supply to streams is likely the most critical factor for maintenance of aquatic habitat in these watersheds. With the retention of Northwest Forest Plan stream buffers, this proposal would likely improve LWD supply over the long-term.

Alternative 2, (Density Management without Harvest)

Measurable effects to stream flow, channel morphology, and water quality as a result of this proposed action are unlikely. This action is unlikely to alter the current condition of the aquatic system either by affecting its physical integrity, water quality, sediment regime or in-stream flows.

Since yarding and hauling would be eliminated, this alternative further reduces the risk of sediment delivery to channels and alteration of hillslope hydrology. As with Alternative 1, the risk of sediment delivery under this alternative is low and alterations in the watershed’s sediment regime as a result of actions under Alternative 2 are likely to be below detectable levels. Water quality and quantity would likely remain at current levels.

Cumulative Effects

Risk of cumulative effects to watershed hydrology, water quality and channel condition under this proposal are essentially the same as those analyzed under Alternative 1: both are low.

Alternative 3, (No action)

No action would result in the continuation of current conditions and trends at this site.

F. WILDLIFE/FISHERIES

Issue: Effects on special status, SEIS special attention and other wildlife species and their habitats.

Wildlife: Affected Environment

A summary of forest habitat conditions presented in the *South Fork Alsea River Watershed Analysis* (USDI-BLM 1995; covers south half of Upper Alsea Watershed) shows that 17,360 acres (43 percent) of the South Fork Alsea Watershed is composed of early to mid-seral habitats. About 8,300 acres of this habitat lies on BLM land (37 percent of 22,500 acres).

The forest stands on BLM lands within one mile of the proposed treatment area (2350 acres) are also composed primarily of early- to mid-seral conifer and mixed conifer/hardwoods (1795 acres, 76 percent), with a few recent harvest areas (325 acres, 14 percent), and very few mature (130 acres, 6 percent) or old-growth patches (76 acres, 3 percent). However, many of the mid-seral stands have a component of old-growth trees widely scattered or sometimes clumped within them. The private lands within one mile (790 acres) are composed mostly of mid-seral conifer and hardwood forests (660 acres) along with some recent clear-cut patches (130 acres).

The *RRTRU* (May 2000) recommended density management treatments in Riparian Reserves to accelerate older forest habitat development (p.8). Sixty-one percent of riparian areas in this watershed are in early- to mid-seral conditions.

The project area is composed of moderate to high density Douglas-fir with some adjacent pockets of mixed conifer/hardwoods. Structural components of late-seral forests (large trees, multiple canopy layers, large hard snags, heavy accumulations of CWD, and species diversity) are generally lacking in the young stands surrounding and including the project area. The legacy of previous harvests in these areas has resulted in scattered accumulations of large down logs in advanced stages of decay, with very few large snags (dbh greater than 20 inches). A few remnant old-growth tree exists within the proposed unit, and several other remnants lie within a few hundred feet of the proposed unit boundary. A few root rot pockets, which are evident within the unit along with windthrow and stem exclusion processes, are now contributing modest amounts of small diameter snags and down logs. The proposed project area does not contain any significant special habitat features. However, some special habitats (e.g. wetlands and seeps) do exist adjacent to the proposed unit. The proposed treatment area adjoins previously thinned units outside of Riparian Reserve (Super Hammer Thinning, 1995).

A great variety of wildlife species may use mid-seral conifer dominant forest habitats. Most of these species can utilize a broader range of habitat conditions than those species associated with old-growth or early-seral habitats. The *South Fork Alsea River Watershed Analysis* found that the primary concern for wildlife species within this watershed was the greatly reduced and fragmented condition of the remaining old-growth habitat, only 2,124 acres (5.3 percent of watershed). Whereas, the early and mid-seral habitats are quite abundant, making up about 43 percent of the current forest habitat in the watershed.

A Biological Evaluation of wildlife resources (see project file) addresses all special status species likely to occur within the Marys Peak Resource Area which might be affected by the proposed action. Many of these species are found in different habitat types or are widespread generalists that are unlikely to be affected by this action. The current status and condition of several of these species

was described within the watershed analysis document. Only the following species groups are discussed concerning their affected environment and environmental consequences related to this proposed action:

- Federally listed wildlife species (species covered by Endangered Species Act)
- Survey and Manage wildlife species (mollusks, red tree-voles)
- Riparian Reserve species (all mollusks, all amphibians, several bats, American marten, and animals mentioned above)
- pertinent bird species (forest raptors, neotropical birds, woodpeckers)
- pertinent mammals (white-footed vole, big game animals)

The only federally listed wildlife species that are likely to occur in the project area are the northern spotted owl and marbled murrelet. In the early 1990's both of these species were listed as Threatened under the Endangered Species Act, due primarily to the loss of late-seral habitat occurring regionally within their range. No spotted owl surveys were required for this project evaluation. However, information from surveys associated with a demographic study of spotted owls indicates that an active owl site exists on Eugene District BLM lands about 0.5 mile south of the proposed unit. Two other historic owl sites within 2.0 miles have been determined to be vacant due to banded owls moving to sites much farther away. The resident owls at the active site appear to utilize a home-range that includes their nest core and the older forest patches farther west and south of their site center. Several detections of spotted owls since 1996 have been documented within 1.0 mile of the proposed harvest unit (two detections less than 0.25 miles). Most of these owls were identified as transients that have since moved out of the area. But a few of these detections were never identified and could have been resident owls from the adjacent known site. The mid-seral stands of the project area are known to provide dispersal habitat for transient spotted owls as they move across the landscape between older more suitable forest stands. The resident spotted owls may occasionally utilize the project area for foraging. Over 78 percent of the BLM lands within this watershed currently provide dispersal habitat for owls.

The nearest occupied marbled murrelet site is 7.5 miles west of the project area. Numerous surveys for marbled murrelets have been conducted within and adjacent to the project area over the years. From 1993 through 1998, surveys associated with the Super Hammer Thinning and Glenbrook Timber Sales found no detections within the older forest patches immediately west and north of the project area. Surveys associated with the remnant trees within this project area were initiated in 1999 and were completed in August 2000, with no murrelet detections. The project area lies about 33 miles inland from the coast, in a landscape of extensive younger forests with very small, isolated older forest patches. None of these older forest patches have been found to be occupied by murrelets and it is very unlikely that the remnant trees adjacent to the project area contain nesting murrelets. The federal lands in and adjacent to the project area have been allocated as General Forest Management Area (GFMA; matrix), but have not been designated as Critical Habitat for either the northern spotted owl or marbled murrelet.

The Survey and Manage (S&M) wildlife species likely to occur within the project area include at least three mollusk species (snails and slugs) and the red tree-vole. About fifty acres, including the project unit have been surveyed for S&M mollusk species (per IM OR-98-097: *Survey and Manage Survey Protocols -Mollusks*). Surveys for mollusks found a total of three *Prophysaon coeruleum* sites and a few other locally common mollusk species, none of which are S&M species as described by the new S&M ROD. Thus there are no sites for mollusks that require S&M mitigation measures.

Red tree-voles are unlikely to use the mid-seral stands within the treatment area due to the young age (65 years old) and small tree size (average dbh less than 16 inches) within the stand. However, this project area was surveyed for this species consistent with approved protocol (per IM-OR-2000-037: *Survey and Manage Protocol - Oregon Red Tree Vole, Version 2.0*, dated February 18, 2000). Surveys within and adjacent to the proposed unit detected several nest/debris clumps, all of which have subsequently been climbed and determined to be from species other than red tree voles. The closest known red tree vole site lies about 0.25 mile north of the project area adjacent to the Glen Hammer project area.

Riparian Reserve Species are those wildlife species identified in the Northwest Forest Plan that are intended to benefit from the habitat conditions and connectivity afforded by forest stands inside the Riparian Reserve land-use allocation. These species include all mollusks, all amphibians, several bat species, American marten, red tree-voles, northern spotted owls, and marbled murrelets. The affected environment for red tree-voles, spotted owls, murrelets and the terrestrial mollusk species of concern has been discussed above. Several amphibians including both terrestrial and aquatic species are known to occur within the watershed and likely occur within the project area. Incidental observations have detected rough-skinned newts, red-backed salamanders, and pacific giant salamanders in or adjacent to the project area. The terrestrial amphibians require adequate forest cover, CWD, and dispersal corridors connecting to similar or better quality habitats. Several bat species are known or likely to occur in the watershed. Some of these species require caves or man-made structures (mines, bridges, buildings) for roost sites and maternal colonies. Some species roost in the forest on foliage, under bark, or in cavities created in large snags or down logs. Riparian zone habitat with adjacent late-seral forest patches may be particularly important to these bats, since insect swarms associated with a nearby water source can provide an abundant high quality food source in close proximity to roosting sites and maternal colonies. The American marten is a carnivore in the weasel family that is very rare in the Oregon Coastal Ranges. It is believed to prefer large patches of late-seral and old-growth forest where it preys mainly on smaller mammals and utilizes large CWD for dens. The older forest patches to the west of the proposed unit may provide suitable habitat for this species. However, there are no known sites for this species within this watershed. Populations of all of these riparian reserve species are suspected to be very localized or declining across the region due to loss of riparian zone habitats, fragmentation of late-seral forests, and loss of high quality CWD.

Pertinent bird species likely to occur within the project area include forest raptors, neotropical migratory birds, and several woodpecker species. No surveys are required for these species. The forest raptors such as the goshawk, Cooper's hawk, and sharp-shinned hawk are known to utilize forest stands similar in age and structure to the project area. These species may nest in these stands and forage for birds and small mammals within the forest or adjacent open habitats. Changes in forest structure by harvesting or through natural succession can cause these species to abandon historic nest sites. No known nest sites for these species are within or adjacent to the proposed unit, nor were any confirmed nests found during project planning visits to the area. Goshawks have nested in similar aged stands within 10 miles of this project area. Cooper's and sharp-shinned hawks have been observed during the breeding season within a few miles of this project area. Several species of neotropical migratory songbirds are known to occur and likely nest within the proposed unit. Some of these species are believed to be declining regionally due to loss of habitat on their breeding grounds and wintering grounds (Central and South America). Most of these species are insectivorous and make use of a variety of forest habitats. Hardwood stands may be especially important to some species for nest sites and foraging habitat. Several woodpecker species have been observed within and adjacent to the project area. These species which excavate cavities in snags and

down logs may be limited by the distribution and quality of coarse woody material across the landscape.

Pertinent mammals of concern include the white-footed vole, and big game species such as deer, elk, cougar, and bear. The white-footed vole is a very rare and relatively unknown small rodent that has been documented within similar forest stands along streams in the South Fork Alsea Watershed. Heavy brush, large CWD, and a prominent hardwood component appear to be important elements of its habitat. The proposed treatment area may provide some of this type habitat for this species. Deer and elk use of the project area has been observed during project planning visits. Deer use of the project area appears to be moderate to high, while very little elk use was noted during the summer and early winter. Cougars may be resident or transient through the project area as they hunt for deer and elk. Black bears are also likely residents within the project vicinity. They often utilize the large clusters of down logs as den sites and, upon emerging in the Spring, may cause some damage to younger Douglas-fir trees as they tear into the bark to feed on the cambium layer. No bear-damaged trees were noted during project planning visits, although some existing large CWD may provide adequate denning habitat for this species.

Fisheries: Affected Environment

The stream in the project area (section 8) is a headwater stream to the South Fork Alsea, with small 1st and 2nd order tributaries (see map). The mainstem stream in section 8 provides habitat for cutthroat trout (*Oncorhynchus clarkii*), but tributary streams do not contain fish. The stream that contains fish is a lower gradient meandering stream, with a dominant substrate of clay and fines. Dominant habitat types are slow moving, shallow pools and riffles.

Alsea Falls (a natural barrier to anadromous fish) is approximately 3.5 miles down stream from the project area.

Consultation with the National Marine Fisheries Service (NMFS) is in progress. The Biological Assessment (BA), which assessed potential impacts to listed fish in the Oregon Coast Evolutionary Significant Unit (ESU), was submitted to NMFS in December 2000. The BA concluded the proposed project is a “may affect, not likely to adversely affect” Oregon Coast Coho Salmon, Oregon Coast steelhead trout and sea-run cutthroat. The Letter of Concurrence, responding to that BA, is expected in March 2001. Any decision on the proposed South Hammer Density Management Project would be in compliance with the pending Letter of Concurrence.

Wildlife: Environmental Consequences

Alternative 1 (Proposed Action)

Direct and Indirect Impacts. The proposed thinning harvest and CWD creation occurring on about 48 acres would change the existing forest structure and alter the development of future forest stand conditions. The direct and indirect changes anticipated to occur to forest habitat characteristics from this proposed action are:

[short-term (less than 10 years)]

- light to moderate reduction of canopy closure (resulting canopy greater than 40 percent) over entire treatment area which represents less than 1 percent of the mid-seral forests within the watershed, or about 2.7 percent of these stands on BLM lands

- within one mile of the project area;
- minor reduction and disturbance to existing CWD material (snags and down logs) resulting from felling and yarding of the unit;
- creation of new hard CWD of optimal size and quality for available stand conditions;
- retention and enhancement of hardwood tree and shrub diversity;

[long-term (greater than 10 years)]

- transition in structural characteristics of the treated stand to more closely resemble late-seral forest habitat (larger diameter trees, sub-canopy development, greater tree species diversity, greater volume and size of hard CWD);
- extended persistence of hardwood tree and shrub cover diversity within conifer-dominant stand.

Suitable habitat for the federally listed wildlife species (spotted owls and marbled murrelets) would not be affected by this action and no Critical Habitat would be modified. The proposed unit would still function as dispersal habitat for spotted owls since the average canopy closure would remain above 40 percent. The resulting effects on prey species (abundance and vulnerability) may be temporary degraded for the resident owls (0.5 miles south of the project area) that might currently use this stand. But the noise created by power equipment use to facilitate project activities is unlikely to disturb spotted owls and marbled murrelets since all the adjacent suitable habitat has been determined to be unoccupied within 0.25 miles of the proposed action. For these reasons the proposed action is considered a “may affect, but not likely adverse affect” to spotted owls and marbled murrelets. To address these concerns, consultation was completed for this action under the *Programmatic Biological Assessment in the North Coast Province for Fiscal Year 2001 Projects which would modify the habitats of Bald Eagles, Northern Spotted Owls, or Marbled Murrelets* (August 11, 2000). A final Biological Opinion (# 1-7-00-F-649) on this consultation was received on October 4, 2000. All applicable terms and conditions from the Biological Assessment have been incorporated into the design features of this proposed action. These design features are expected to be the same standards that would be included in the final Biological Opinion.

There are no S&M mollusk species that would be effected by this action. Furthermore, the proposed action is unlikely to contribute to the decline in viability of non-S&M mollusk species (like *Prophysaon coeruleum*) for the following reasons:

- the density management action would maintain an average canopy closure above 40 percent which should provide an adequate moisture regime for periods when mollusks are active;
- pertinent habitat features for mollusk fauna (e.g., large CWD, hardwood tree and shrub understory) would not be significantly affected within the treatment unit;
- the hardwood tree and shrub components within the treatment unit would be retained and enhanced relative to non-treatment areas;
- fresh input of hard CWD and enhancement of stand structure within Riparian Reserves should benefit key components of mollusk habitat over the long-term; and,
- habitat that is more suitable for mollusks (e.g., late-seral forests, old-growth patches, maple hardwoods) in the vicinity of the project area, and which likely contains more of these species, would not be affected by this action.

The proposed unit is considered marginal habitat for red tree-voles and no evidence of red tree vole use was found within or adjacent to the proposed unit. Project activities within the unit boundaries

would have no significant impact on red tree-vole habitat, and would not affect older forest patches in the vicinity where red tree voles are more likely to be present.

None of the remaining wildlife species discussed in the affected environment are likely to be substantially affected by this proposed action, so as to contribute to their decline or elevate their status for concern for the following reasons:

- species linked to Riparian Reserve issues are mostly associated with late-seral forest conditions, which would be enhanced within this stand with negligible effects to existing function of the local Riparian Reserve corridors;
- only a very small percentage (less than 0.1 percent) of the early to mid-seral habitat within the watershed would be affected by this proposed project, and locally (within 1 mile), only 2.7 percent of this habitat type on BLM lands would be affected;
- existing habitat function within the proposed unit would not be lost, but rather it would be retained, enhanced, and continue to provide habitat for the majority of species currently present;
- the remaining species of concern that may occur within the project area either do not make significant use of this habitat type or their use of this habitat is dependent on structural components (canopy closure, hardwoods, snags and down logs, existing stick nests) that would not be substantially diminished within the local landscape;
- and lastly, the resulting forest structure and CWD creation is likely to improve overall quality of habitat for many species in the immediate future.

Cumulative Impacts

Within the South Fork Alsea Watershed Analysis area, BLM has commercially thinned less than 300 acres of mid-seral forest stands within the past 10 years (about 1.3 percent of BLM ownership in watershed). Due to ecological succession, the amount of habitat in each seral stage within this watershed is not stagnant, but constantly in transition from early open habitats toward mature forest stands. A large portion of the early- to mid-seral stands are on private lands and are above the average rotation age for industrial forest management. Thus, it is likely that the trend for this habitat would show a sharp decline over the next decade, while the percent of open habitats (recent harvests) would increase. Open road miles are also likely to increase as old abandoned logging roads are reopened and new roads are created to provide access for private harvests. Regeneration harvests on BLM lands would likely contribute only a minor amount to this trend during the next decade. In the near future, BLM would evaluate additional commercially thinning areas (likely to be less than 600 acres) within the early and mid-seral forests within this watershed. While thinning harvests do alter forest structure, such treatments do not result in a loss of habitat for most of the species of concern that are known or suspected to use these forests. The cumulative impact on habitat availability for species of concern as a result of foreseeable BLM thinning treatments within the next 10 years is considered minor.

Alternative 2 (Density Management Without Harvest)

This alternative would have similar effects to wildlife species as outlined in Alternative 1 (proposed action). However, the large amount of remaining CWD and the risk of insect outbreak pose a greater risk of uncertainty to wildlife species and their habitat. Leaving large numbers of relatively large trees on the ground would inhibit access and movement through the riparian corridor by large mammals such as deer and elk. Heavy accumulations of down logs might benefit some small

mammals, terrestrial amphibians, and invertebrates that would have an abundance of hiding cover. The high risk of insect outbreaks in the short-term might benefit wood-peckers and other insectivorous birds. But could also result in additional stand mortality that would lower the average canopy cover for the forest below 40 percent. Such a loss of forest canopy could degrade the function of the current dispersal and foraging habitat within 1.5 miles of a known spotted owl site; thereby resulting in a determination of "may affect, likely to adversely affect" to spotted owls. The risk of an insect outbreak would also mean a greater risk of losing remnant old-growth trees, which may currently provide suitable habitat for marbled murrelets.

Alternative 3 (No Action)

This alternative would result in no change to the affected environment. Short-term impacts to species as described in Alternative 1 would be avoided. However, desirable gains in forest structure would not be achieved, except through natural processes which may take considerably longer.

Fisheries: Environmental Consequences

Alternative 1 (Proposed action)

The proposed action would have no measurable adverse impacts to local fish and fish habitat. Habitat and channel conditions are expected to be maintained. Impacts may occur due to immeasurable inputs of sediment, but would be short-term (a year or less). Seasonal restrictions, one end suspension, small size of the logs, and small amount of timber that would be removed, in conjunction with "stream protection areas," would keep sediment delivery to a minimal level.

Yarding corridors through the stream protection area would be required to get one end suspension of logs in the partial cut area, but no trees would be yarded through the stream protection zone. Approximately four corridors would be needed in section 8, and each corridor would be approximately 15 feet wide. The majority of trees that would be felled are red alder. Trees felled within the stream protection area would be left on site. These small openings within the stream protection area would not create water temperature increases due to the small width of the stream and amount of heavy brush. Thinning within the riparian area would enhance stand conditions, growing trees faster than if the stand were to grow naturally. This would increase the potential for high quality large woody debris.

Alternative 2 (Density Management without Harvest)

This action would allow trees within the riparian reserve to grow at a faster rate and contribute large quality woody debris to streams without the possibility of small inputs of sediment. No tail hold trees would be needed, therefore, no corridors would need to be cut over the stream. This action would not contribute to sediment inputs due to yarding.

Alternative 3 (No action)

No action would result in the continuation of current habitat conditions and trends at this site.

IV. MONITORING

Monitoring would be accomplished through timber sale contract administration and in accordance with monitoring guidelines in Appendix J of the RMP. Effectiveness monitoring is being done on Super Hammer Thinning timber sale which was harvested in 1998 and has a similar prescription to this sale. Monitoring of the South Hammer Density Management Project could be used to determine the effectiveness of the treatment and to help make recommendations for the timing of future thinning harvests. Conifer understory seedlings, both planted and naturals, would be monitored at intervals from 1-3 years or until understory has satisfactorily developed to determine if replanting or release from brush competition is necessary. Further in the future, both understory and overstory would be evaluated for further density management in order to manage for structural and species diversity.

V. CONSULTATION

The project area is in the South Fork Alsea River drainage. This watershed has anadromous fish approximately 3.5 miles downstream from the project area. The Biological Assessment (BA), which assessed potential impacts to listed fish in the Oregon Coast ESU was submitted to NMFS in December 2000. The BA concluded the proposed project is a “may affect, not likely to adversely affect” Oregon Coast Coho Salmon, Oregon Coast steelhead trout and sea-run cutthroat.

The South Hammer Density Management Project was submitted for consultation to the U.S. Fish and Wildlife Service (FWS) on August 4, 2000. A final Biological Opinion (# 1-7-00-F-649) on this consultation was received October 4, 2000. The proposed action is considered a “may affect, but not likely adverse affect” to northern spotted owls and marbled murrelets.

In addition to the interdisciplinary team that developed and reviewed this proposed action, the following agencies or individuals were or would be consulted:

Oregon Department of Fish and Wildlife
Oregon Department of Forestry
Coast Range Association
Associated Oregon Loggers
Oregon Department of Environmental Quality
Oregon Water Resources Department
Benton County Board of Commissioners
Northwest Environmental Defense Center
Oregon Natural Resources Council
State Historic Preservation Officer
Environmental Protection Agency
Confederated Tribes of Siletz Indians
Confederated Tribes of Grande Ronde
Benton Soil and Water Conservation District

VI. INTERDISCIPLINARY TEAM MEMBERS

NAME	TITLE	DATE/INITIAL
Gary Humbard	Lead Forester/ Logging System Specialist	2/9/01 GLH
Scott Hopkins	Wildlife Biologist	2-12-01 SH
Tom Tomczyk	Soil Scientist/Fuels Specialist	2-20-01 T&T
Ron Exeter	Botanist	Feb 12, 2001 RE
Steve Hagen	Cruiser/Appraiser	FEB-21, 2001 SCH
Tom Vanderhoof	Cultural Specialist	FEB 13, 2001 TMV
Steve Liebhardt	Fisheries Biologist	March 8, 2001 GH ^{for} SL
Patrick Hawe	Hydrologist	Feb 15, 2001 PH
Belle Smith	NEPA Coordinator	March 8, 2001 BS
Amy Haynes	Riparian Ecologist	all 2/12/01
Randy Gould	Natural Resource Staff Administrator (management review)	R Gould 03/06/01

APPENDIX A: PROJECT MAPS

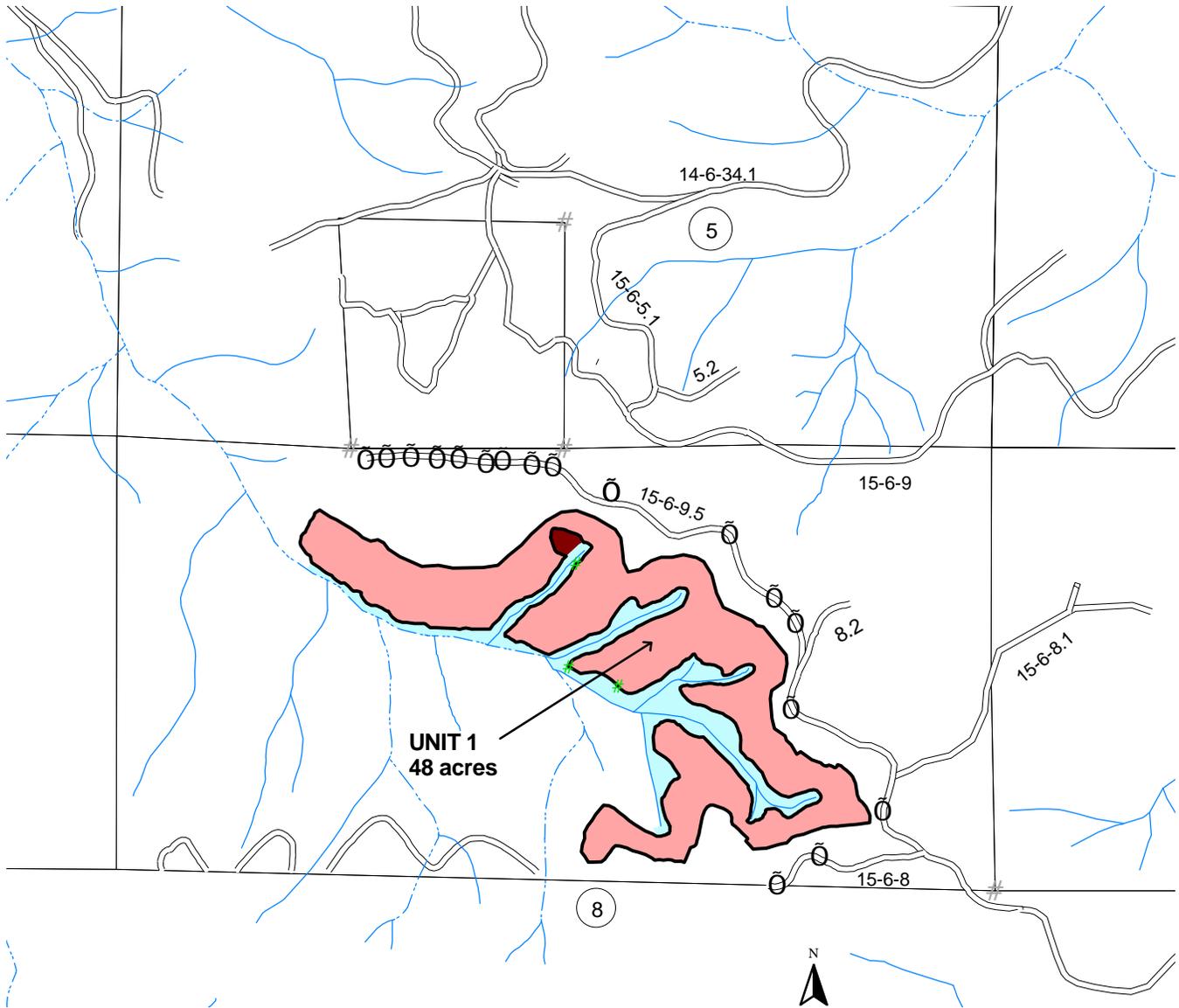
Map 1: Sale Plan
 Map 2: Sale Area Location

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Appendix A
Map 1

South Hammer

T. 15 S., R. 6 W. Section 8 W. M.
SALEM DISTRICT - OREGON



LEGEND

Scale: 1" = 1,000'

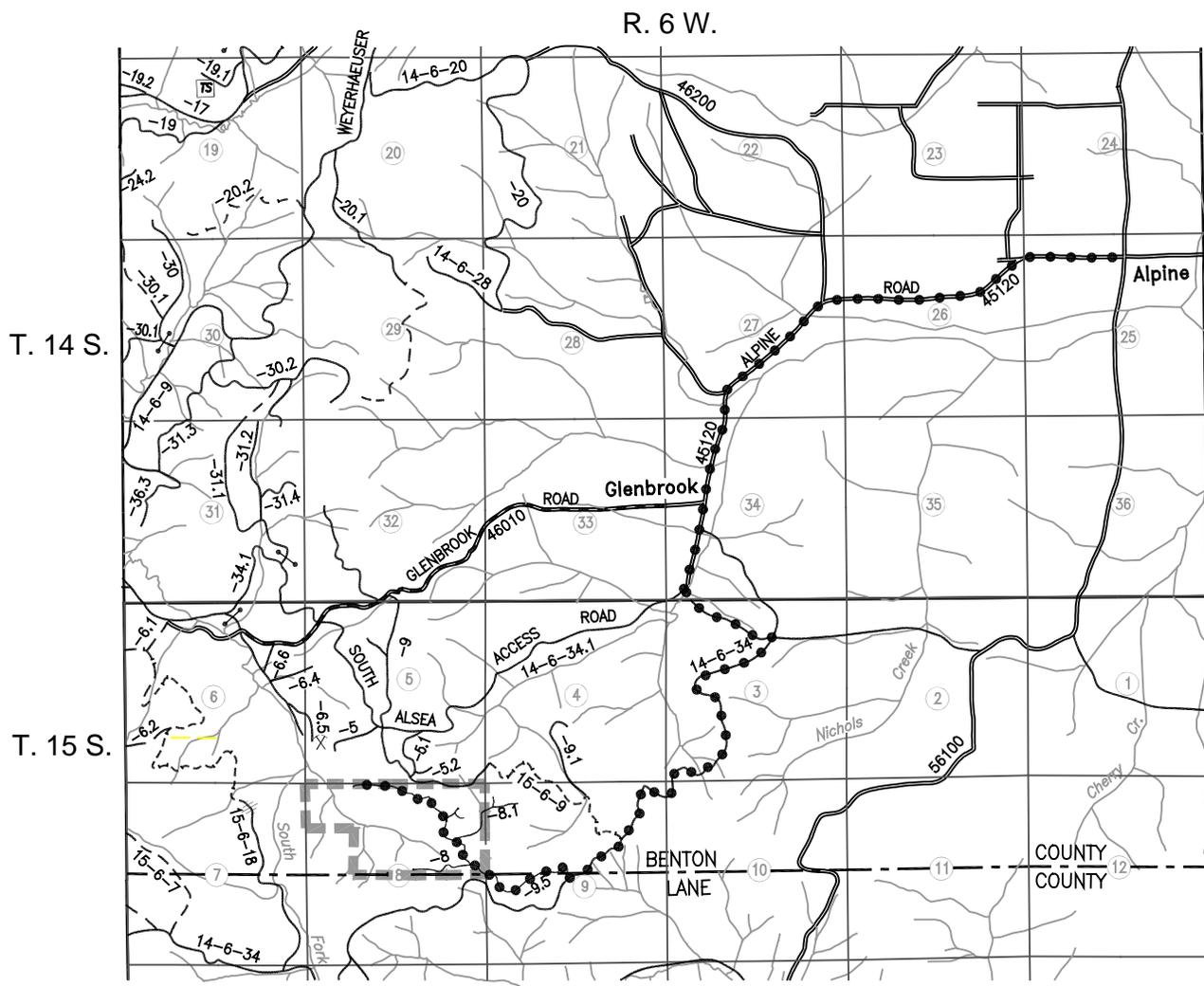
- | | |
|--|---|
|  Partial cut area |  Existing Roads |
|  Fungus protection area |  Fish bearing streams |
|  Remnant old growth - single tree |  Non fish bearing stream |
|  Stream protection area |  Corner found |
|  Landing | |

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T. 15 S., R. 6 W., Section 8 W.M. - SALEM DISTRICT - OREGON

SOUTH HAMMER
PROJECT LOCATION MAP

Scale: 1" = 1 mile



Project location



Access route

APPENDIX B: REVIEW SUMMARIES

The following table summarizes environmental features which the Bureau of Land Management is required by law or policy to consider in all Environmental Documentation (BLM Handbook H-1790-1, Appendix 5: Critical Elements of the Human Environment).

ENVIRONMENTAL FEATURES

Environmental Feature	Affected/Not Affected/May Be Affected	Remarks
Air Quality	Affected	Pile burning would be accomplished in compliance with the Oregon Smoke Management Plan.
Areas of Critical Environmental Concern	Not Affected	Not in or adjacent to an ACEC.
Cultural, Historic, Paleontological	Not Affected	Post survey would be completed as stated in Protocol for Managing Cultural Resources on Lands Administered by the BLM dated August 5, 1998 in Oregon; Appendix D.
Prime or Unique Farm Lands	Not Affected	
Flood Plains	Not Affected	
Native American Religious Concerns	Not Affected	
Threatened, Endangered, or Special Status Plant Species or Habitat	Affected	No known sites found. See Vegetation, Special Status/Attention Species, Chapter III
Threatened, Endangered, or Special Status Animal Species or Habitat	Wildlife: Affected Fish: Affected	USF&W consultation completed. Terms and conditions of BO # 1-7-00-F-649 incorporated into project design features. Informal consultation with NMFS is ongoing.
Hazardous or Solid Wastes	Not Affected	None on site nor created by proposed action.

Environmental Feature	Affected/Not Affected/May Be Affected	Remarks
Drinking or Ground Water Quality	Not Affected	
Wetlands or Riparian Reserves	Affected	See Aquatic Conservation Strategy (Appendix C)
Environmental Justice	Not Affected	
Invasive, Nonnative Species	Affected	See Botany Report in EA file.
Wild and Scenic Rivers	Not Affected	No Wild and Scenic Rivers in project area.
Wilderness	Not Affected	No Wilderness in project area.

Appendix C to EA# OR080-00-09 SOUTH HAMMER

Aquatic Conservation Strategy Objectives Review Summary

(Note - See RMP pg 5-6 for more detailed explanations of the ACS objectives)

ACS Objective	How Project Meets the ACS Objective
<p>1. Maintain and restore distribution, diversity, and complexity of watershed and landscape features to ensure protection of aquatic systems.</p>	<p>Only 10 percent of the stands in the South Fork Alsea watershed are currently classified as having an understory. Most mid-seral stands (age 30-80) are uniform evenly-spaced Douglas-fir stands (<i>RRTU</i>, p.3). Generally the watershed lacks large woody debris potential for streams (<i>SFAWA</i>, p.65) and lacks snags, down wood, sub-canopy layers and species diversity (<i>SFAWA</i>, p. 40). The proposed density management project would be a means to enhance late-successional forest conditions and speed up attainment of these conditions across the landscape. Since Riparian Reserves provide travel corridors and resources for aquatic, riparian dependant and other riparian and/or late-successional associated plants and animals, the increased structural and plant diversity would ensure protection of aquatic systems by maintaining and restoring the distribution, diversity and complexity of watershed and landscape features..</p>
<p>2. Maintain and restore spatial connectivity within and between watersheds.</p>	<p>Long term connectivity of terrestrial watershed features would be improved by enhancing conditions for understory development (structural diversity), increasing the proportion of minor species in the stand (species diversity), increasing growth rates on remaining trees and creating fresh snags and down wood. In time, these reserves would improve in functioning as refugia for late successional, aquatic and riparian associated and dependent species. In the short term, the fresh snags and down wood created by the project would begin to mitigate the lack of snags and down wood in the watershed.</p> <p>No stream crossing culverts would be used that would potentially hinder movement of aquatic species, therefore no barriers would be created.</p> <p>Both terrestrial and aquatic connectivity would be maintained, and over the long-term, as Riparian Reserves develop late-successional characteristics, lateral, longitudinal and drainage connectivity would be restored.</p>

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<p>3. Maintain and restore physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.</p>	<p>A no cut stream protection buffer would maintain the integrity of shorelines, banks and bottom configurations. Criteria used to designate buffers were riparian vegetation, significant slope breaks, high water tables, and areas contributing to stream shading. (EA, p. 19 and Appendix F) All buffers are a minimum of 25 feet. Trees would be directionally felled within one tree height of the buffers and any part that falls within the buffers would not be yarded out (EA p. 5), thereby preventing disturbance to stream banks and bottom configurations.</p> <p>Channels in the project area appear to be stable and functional. In the short-term, this proposal is unlikely to alter the current condition of channels in the project area. Minimization of disturbances from the proposed project (i.e., increased flows or sediment delivery) is likely to result in the maintenance of stream channels in their current condition. Over the long-term, reductions in stand density would likely increase riparian forest health and tree size. This would lead to increased large wood recruitment for stream channels, an important factor in proper channel function. In addition, more open stands would allow for the growth of important riparian species in the understory, such as western redcedar, which are currently suppressed. In the upper South Fork Alsea River, large wood structure in the channel is particularly important because it has been depleted to levels far below its natural range. Large wood in the channel would ultimately slow stream velocity, increase retention of organic material, capture bedload, and improve aquatic habitat as well as conditions for beaver (EA, p. 20)</p> <p>Management activity throughout the project area is not likely to cause any alteration in water flows that could affect channel morphology.</p>
<p>4. Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems.</p>	<p>Water quality necessary to support healthy riparian, aquatic, and wetland ecosystems would be maintained. In response to the high concentration of low gradient, open channel reaches in this watershed, it is likely that ambient summer stream temperatures have always been higher relative to other coast range streams. Although riparian vegetation is less effective at providing shade due to the simplified and widened main channel on the upper South Fork Alsea, current stream-side vegetation on tributary channels in the project area is adequate to shade surface waters during summer base flow (EA, p. 17). Although thinned, substantial portions of the riparian canopy would be retained, therefore maintaining riparian microclimate conditions and protecting streams from increases in temperature (EA, p. 19). Therefore, potential for increases in summer stream temperatures as a result of this action are unlikely.</p> <p>Tree removal would not occur on steep, unstable slopes where the potential for mass wasting adjacent to stream reaches is high. Therefore, increases in sediment delivery to streams due to mass wasting are unlikely to result from this action. In addition, potential impacts from tree harvest would be mitigated and, with the implementation of BMPs, are unlikely to contribute measurable amounts of sediment to streams (EA, p. 19).</p> <p>No new road construction is planned for this timber sale.</p>

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<p>5. Maintain and restore the sediment regime under which system evolved.</p>	<p>Tree removal would not occur on steep, unstable slopes where the potential for mass wasting adjacent to stream reaches is high. Therefore, increases in sediment delivery to streams due to mass wasting are unlikely to result from this action. In addition, potential impacts from tree harvest would be mitigated and, with the implementation of BMPs, are unlikely to contribute measurable amounts of sediment to streams (EA p. 19).</p> <p>Logs in the proposed sale are relatively small and there would be adequate slash on the ground in the yarding corridors to yard over. Therefore, following the design features, yarding roads would cause only light to moderate compaction in a narrow strip less than 4 feet in width, and very little or no top soil loss would occur (EA p. 15).</p> <p>The main haul routes would be on rocked roads to the South Fork Alsea Access Road, which is paved. Timber hauling during periods when water is flowing on roads and into ditches could potentially increase stream turbidity for short periods of time if flows from ditches are large enough to enter streams. If a problem develops, corrective measures would be implemented during contract administration (EA p. 19).</p> <p>No new road construction is planned for this timber sale.</p> <p>Project design features would maintain the physical integrity of the hillslopes and channel; no alteration of the current sediment regime is expected (EA p.18).</p>
<p>6. Maintain and restore instream flows.</p>	<p>This proposal is unlikely to substantially alter stream flow or peak flow events. Alterations in the capture, infiltration and routing (both surface and subsurface) of precipitation have been documented on watersheds in the Pacific Northwest and other parts of the world. However, the actions reviewed under this proposal would affect less than 1 percent of the forest cover in the south Fork Alsea watershed. Detectable direct or indirect effects to streamflow as a result of this action are unlikely. However, this action was analyzed for its potential contribution to cumulative effects to streamflow in this watershed (EA p. 20) The cumulative effects analysis showed a WAR (water available for runoff) rating of low (less than 10 percent increase) (EA Table 1, p. 22).</p>

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

The proposed thinning would not alter existing patterns of floodplain inundation or water table elevation as it would have no effects or only negligible short-term negative effects on existing flow patterns and stream channel conditions.

This proposal is unlikely to substantially alter stream flow or peak flow events. Alterations in the capture, infiltration and routing (both surface and subsurface) of precipitation have been documented on watersheds in the Pacific Northwest and other parts of the world. However, the actions reviewed under this proposal would affect less than 1 percent of the forest cover in the south Fork Alsea watershed. Detectable direct or indirect effects to streamflow as a result of this action are unlikely. However, this action was analyzed for its potential contribution to cumulative effects to streamflow in this watershed (EA p. 19). The cumulative effects analysis showed a WAR (water available for runoff) rating of low (less than 10 percent increase) (EA Table 1, p. 22).

Channels in the project area appear to be stable and functional. In the short-term, this proposal is unlikely to alter the current condition of channels in the project area. Minimization of disturbances from the proposed project (i.e., increased flows or sediment delivery) is likely to result in the maintenance of stream channels in their current condition. Over the long-term, reductions in stand density would likely increase riparian forest health and tree size. This would lead to increased large wood recruitment for stream channels, an important factor in proper channel function. In addition, more open stands would allow for the growth of important riparian species in the understory, such as western redcedar, which are currently suppressed. In the upper South Fork Alsea River, large wood structure in the channel is particularly important because it has been depleted to levels far below its natural range. Large wood in the channel would ultimately slow stream velocity, increase retention of organic material, capture bedload, and improve aquatic habitat as well as conditions for beaver (EA p. 20).

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8. Maintain and restore the species composition and structural diversity of plant communities in riparian zones and wetlands to provide thermal regulation, nutrient filtering, and appropriate rates of bank erosion, channel migration and CWD accumulations.

The actual riparian zone (as defined by criteria in EA p. 19 and Appendix F) along streams would be excluded from treatment, by designating stream protection buffers, and only the upslope portions of the Riparian Reserves would be included in the density management treatment.

All trees would be directionally felled away from streams within one tree height of stream protection buffers and if a cut tree does fall within a stream protection buffer, that part of the tree would remain (EA p. 5). Stream buffers and residual trees would continue shading streams.

Structural components of late-seral forests (large trees, multiple canopy layers, large hard snags, heavy accumulations of down wood, and species diversity) are generally lacking in the young stands surrounding and including the project area (EA p. 24) Aside from protecting actual riparian vegetation, the proposed project would restore the species composition and structural diversity of plant communities by enhancing conditions for understory development (structural diversity), increasing the proportion of minor species in the stand (species diversity), increasing growth rates on remaining trees and creating fresh snags and down wood (EA p. 12)

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

Habitat to support well distributed riparian-dependent and riparian associated species would be restored by reducing overstocked stands, moderating tree species diversity, altering forest structural characteristics and amending coarse woody debris conditions.

Thinning within the riparian area would enhance stand conditions, growing trees faster than if the stand were to grow naturally. This would increase the potential for future high quality instream large woody debris. (EA p. 30).

The prominent habitat features found at mollusk sites (large CWD, hardwood tree and shrub understory, moderate to high canopy closure) would not be significantly affected, thereby maintaining existing microsite characteristics. In fact fresh inputs of hard CWD and enhancement of stand structure with Riparian Reserves should benefit key components of mollusk habitat over the long-term. Species linked to Riparian Reserves issues are mostly associated with late-seral forest conditions, which would be enhanced within this stand with negligible affects to existing function of the local Riparian Reserves corridors. The resulting forest structure and CWD creation is likely to improve overall quality of habitat for many species in the immediate future. (EA p. 29)

Over the long-term, reductions in stand density would likely increase riparian forest health and tree size. This would lead to increased large wood recruitment for stream channels, an important factor in proper channel function. In addition, more open stands would allow for the growth of important riparian species in the understory, such as western redcedar, which are currently suppressed. In the upper South Fork Alsea River, large wood structure in the channel is particularly important because it has been depleted to levels far below its natural range. Large wood in the channel would ultimately slow stream velocity, increase retention of organic material, capture bedload, and improve aquatic habitat as well as conditions for beaver. (EA p. 20)

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BENEFICIAL USES REVIEW SUMMARY		
Downstream Beneficial Uses (Salem FEIS 3-9)	Designated Use (Y/N)?	Remarks /References
Public Water Supply	N	WRIS
Domestic Water Supply	N	WRIS
Irrigation	Y	See EA p.19
Fisheries	Y	See EA p.19
Wildlife	Y	See specialist report.
Recreation	Y	See EA p.19
Maintenance of Aesthetic Quality	Y	See EA p.19
OTHER WATER ISSUES		
Issue/Concern	Listed (Y/N)	Remarks /References
DEQ 303d listed stream	N	
Key Watershed	N	

*WRIS = Oregon Department of Water Resources

APPENDIX E: GUIDELINES TO REDUCE BARK BEETLE MORTALITY

The following guidelines (from Hostetler, B. and D. Ross. 1996. *Generation of Coarse Woody Debris and Guidelines for Reducing the Risk of Adverse Impacts by Douglas-fir Beetle*. Westside Forest Insect and Disease Technical Center. Unpublished.) should be followed to reduce the probability of Douglas-fir bark beetle (DFB)-caused mortality in residual standing trees in westside forests where live Douglas-fir are being cut for CWD.

- **Fell and leave the minimum number of trees possible that would allow achievement of CWD objectives.** Remember, the rule-of-thumb is that the number of standing trees killed would be about 60 percent of the number that are felled.
- **Fell the trees no earlier than July and no later than the end of September – the later they can be felled during this period, the better.** This would help insure that the trees are felled after the primary flight of DFB and that some drying of logs would occur so that the logs would be less suitable as host material the following spring.
- **Staggering the years in which trees are being felled may be beneficial if large numbers of trees are being felled and if enough time is left between felling.** The time period between tree falling should be at least three years; four would be better. Otherwise, the situation may be exacerbated by allowing beetles to build to even higher population levels.
- **Monitor what is happening in these stands regarding infestation of down logs and infestation and killing of standing live Douglas-firs.** To date, no data have been collected from areas where silvicultural practices such as this have been used, and any information gathered would be useful under the principles of adaptive management.
- **If DFB populations are at high levels in the general area because of large amounts of recent blowdown, it would be prudent to postpone felling of CWD trees until populations subsided.** This would be two years from the summer in which many discolored trees are present (or four years after the first spring following the blowdown), unless there are large amounts of blowdown in subsequent years. If this is the case, one should wait longer. Once the infested trees discolor, the extent and intensity of the previous year's DFB activity can be estimated using the Annual Aerial Insect Detection Survey maps.
- **If possible, fell tree species other than Douglas-fir for CWD.**

APPENDIX F: CRITERIA FOR IDENTIFYING NO-CUT STREAM BUFFERS

- 1) A 25 foot minimum buffer would be flagged to exclude the following areas based on field identified features (whichever is greatest). Activities may occur in this area, but material would not be removed and heavy machinery or equipment would not be allowed.
 - a. Slope break- point below which the slope is actively eroding and contributing sediment to the stream.
 - b. Floodplain- flat, accessed by the stream once in a blue moon.
 - c. Stream banks- feature which contains the “active” stream channel.
 - d. High water tables- flat, mushy soils, skunk cabbage, standing water, etc..
 - e. Flood prone- 2 x max depth @ bankfull (for streams with none of the above).
- 2) “Minimum” would be modified based on associated issues or field identified risks. Examples include-
 - a. Perennial streams at risk for temperature increases due to the action (i.e., southern aspect, low topographic relief, vegetation provides significant shading). We can either extend the minimum to 100 feet at these sites or apply a model to get more precision in our estimate.
 - b. Unstable slopes- this is open to discussion. We may want to thin along debris torrent prone headwater channels even though they are potentially “unstable” because these areas are significant LWD source areas. However, actively eroding sites adjacent to streams with ravel on the surface and “jack-strawed” trees may be excluded.
 - c. “Sensitive” streams- sand bed channels or channels with high residual impacts (bank erosion, incision, heavy fine sediment load, etc) may warrant extra protection.