



United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Salem District Office
1717 Fabry Road S.E.
Salem, Oregon 97306
<http://www.or.blm.gov/salem/>



In Reply Refer To:
5410 (085)

Bottleneck LSR Enhancement
Environmental Assessment No. OR080-07-16

Dear Reviewer,

The Bureau of Land Management, Salem District, Marys Peak Resource Area, invites you to review the Bottleneck Late Successional Reserve (LSR) Enhancement Environmental Assessment (EA) and Finding of No Significant Impact (FONSI). This document analyzes the probable impacts from the proposed projects. The EA and FONSI are available for review at the Salem District office and on the internet at Salem BLM's website, <http://www.blm.gov/or/districts/salem/index.htm> (under Plans and Projects).

The proposed Bottleneck LSR Enhancement project areas are located in Township 7 South, Range 9 West, Sections 8 and 9, Willamette Meridian, in the Salmon River-Siletz River Watershed east of Lincoln City, Oregon. The goals of the projects are to accelerate the development of late-successional forest (enhance structural diversity, create terrestrial large down wood, and increase diameter growth to achieve future potential coarse woody debris and instream large wood sources) which serve as habitat for the northern spotted owl and marbled murrelet. An additional goal of the projects is to maintain and develop a safe, efficient and environmentally sound road system that reduces environmental effects.

The proposed actions include:

1. Density management thinning on approximately 161 acres of Late Successional Reserve and Riparian Reserve land use allocations using skyline cable and ground based yarding systems. Approximately 1.0 mile of new road construction would be decommissioned and closed to motor vehicles following operations.
2. Immediate creation of snags and coarse woody debris.
3. Enhance a 24 acre late-seral (103 years old) stand, and a 4 acre deciduous swamp.
4. Renovation of existing road that is contributing to sedimentation.

We are interested in hearing from you and ask that you provide us with your comments by April 2, 2009. Please respond by then so a decision can be made on the action. Comments specific to the alternatives and assessment of potential environmental effects would be the most helpful. Supporting documentation such as specialist reports can be reviewed in our district office between the hours of 7:45 a.m. and 4:30 p.m., Monday through Friday (excluding holidays), starting on March 4, 2009.

If you have questions about the environmental assessment, please contact Gary Licata at (503) 315-5948 or via email at: gary_licata@or.blm.gov. 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,

A handwritten signature in black ink that reads "Trish Wilson". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Trish Wilson
Field Manager
Marys Peak Resource Area

* Note -Comments, including names and addresses of respondents, will be available for public review at the same time as the EA during regular business hours (7:45 a.m. to 4:30 p.m.), Monday through Friday, except holidays. "Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment – including your personal identifying information – may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so."

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**Bottleneck Late-Successional Reserve Enhancement
Environmental Assessment and
Finding of No Significant Impact**

Environmental Assessment Number OR-080-07-16

March 3, 2009

United States Department of the Interior
Bureau of Land Management
Oregon State Office
Salem District
Marys Peak Resource Area

Responsible Agency: USDI - Bureau of Land Management

Responsible Official: Trish Wilson, Field Manager
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Abstract: This environmental assessment (EA) discloses the predicted effects of two projects located on federal lands in Township 7 South, Range 9 West Sections 8 and 9, Willamette Meridian located in the Salmon River-Siletz River 5th-field Watershed.

- ✓ Project 1 (Mid-Seral Habitat Enhancement) proposes to thin approximately 161 acres of dense, mid-seral (68 years old) conifer forest, release existing wolf trees (large trees with full live crowns), and create snags and coarse woody debris (CWD). This project is designed to improve wildlife habitat for species which depend upon late-seral/old-growth forest conditions by accelerating the development of these conditions.
- ✓ Project 2 (Late-Seral Habitat and Deciduous Swamp Enhancements) proposes to enhance a 24 acre late-seral (103 years old) stand, and a 4 acre deciduous swamp, both occurring adjacent to the mid-seral forest of Project 1. Habitat within the late-seral stand would be enhanced by increasing structural complexity (live, dead, horizontal, and vertical) through selective cutting and girdling around existing wolf trees which exhibit complex crown structure. The objective for the swamp site is to maintain the water level and improve the dead wood habitat by cutting and girdling encroaching conifers and hardwoods.

These projects would occur in Late-Successional Reserve (LSR) and Riparian Reserve (RR) Land Use Allocations (LUA) within the North Coast Range Adaptive Management Area.

As the Nation's principal conservation agency, the Department of Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering economic use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interest of all people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. administration.

FINDING OF NO SIGNIFICANT IMPACT

Introduction

The Bureau of Land Management (BLM) has conducted an environmental analysis (Environmental Assessment Number OR080-07-16) for a proposal to implement two projects in Late-Successional Reserve (LSR) and Riparian Reserve (RR) Land Use Allocations (LUAs) within the North Coast Range Adaptive Management Area as follows:

- ✓ *Project 1:* Conduct density management through thinning, and wolf tree release through selective cutting and girdling, on approximately 161 acres of 68 year old stands in LSR and RR LUAs to improve wildlife habitat for species which depend upon late-seral/old-growth forest conditions, by accelerating the development of these conditions.
- ✓ *Project 2:* Enhance a 32 acre late-seral (103 years old) stand, and a 4 acre deciduous swamp, both located adjacent to the mid-seral forest of Project 1. Habitat within the late-seral stand would be modified by increasing structural complexity (live, dead, horizontal, and vertical) through selective cutting and girdling around existing large green trees which exhibit complex crown structure (wolf trees). The objective for the deciduous swamp is to maintain water levels and improve the dead wood habitat by cutting and girdling encroaching conifers and hardwoods.

The projects are on BLM-managed land in Township 7 South, Range 9 West, Sections 8 and 9 Willamette Meridian.

These projects are in conformance with the *Record of Decision and Resource Management Plan-Salem District*, December, 2008 (2008 ROD/RMP).

Revision of a resource management plan necessarily involves a transition from the application of the old resource management plan to the application of the new resource management plan. A transition from the old resource management plan to the new resource management plan avoids disruption of the management of BLM-administered lands and allows the BLM to utilize work already begun on the planning and analysis of projects.

The 2008 ROD / RMP allowed for such projects to be implemented consistent with the management direction of either the 1995 resource management plan or the Approved Resource Management Plan attached to the Record of Decision, at the discretion of the decisionmaker (2008 ROD/RMP pp. 5-6)

These projects meet the requirements designated in the 2008 ROD for such transition projects:

1. A decision was not signed prior to the effective date of the 2008 ROD.
2. Preparation of National Environmental Policy Act documentation began prior to the effective date of the 2008 ROD.
3. A decision on the project will be signed within two years of the effective date of the 2008 ROD.
4. Regeneration harvest would not occur in a late-successional management area or deferred timber management area.

5. There would be no destruction or adverse modification of critical habitat designated for species listed as endangered or threatened under the Endangered Species Act.

Since the planning and design for this project was initiated prior to the 2008 ROD, it contains certain project design features that are not consistent with the management direction contained in the 2008 RMP.

The design features for this project that are not consistent with the 2008 RMP include:

Design Feature	Bottleneck Project	2008 ROD
Minimum stream protection zone width on all streams and wetland areas on each side of the stream channel	55 feet (EA p. 9)	35 feet (ROD p 38)

The 2008 ROD anticipated these inconsistencies and projected they would not alter the analysis of effects in the associated final environmental impact statement.

The implementation of this project will not have significant environmental effects beyond those already identified in the Final EIS/Proposed RMP. The selected action does not constitute a major federal action having significant effects on the human environment; therefore, an environmental impact statement will not be prepared.

Implementation of the proposed action would conform to management actions and direction contained in the *Bottleneck Late Successional Reserve Enhancement Environmental Assessment* (Bottleneck LSR Enhancement EA). The Bottleneck LSR Enhancement EA is attached to and incorporated by reference in this Finding of No Significant Impact (FONSI) determination. The analysis in this EA is site-specific and supplements analyses found in the *Salem District Proposed Resource Management Plan/Final Environmental Impact Statement*, September 1994 (RMP/FEIS) (EA p. 2). The Bottleneck LSR Enhancement projects have been designed to conform to the *Salem District Record of Decision and Resource Management Plan*, May 1995 (RMP) and related documents which direct and provide the legal framework for management of BLM-managed lands within the Marys Peak Resource Area (EA pg. 3). Consultation with the U.S. Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) is described in Section 6.0 of the EA.

The EA and FONSI will be made available for public review at the Salem District office and on the internet at Salem BLM's website, <http://www.blm.gov/or/districts/salem/index.htm> (under Plans and Projects) from March 4, 2009 to April 2, 2009. The notice for public comment will be published in a legal notice by the *News-Guard* and *News-Times* newspapers. Comments received by the Marys Peak Resource Area of the Salem District Office, 1717 Fabry Road SE, Salem, Oregon 97306, on or before April 2, 2009 will be considered in making the decisions for these projects.

Finding of No Significant Impact

Based upon review of the Bottleneck LSR Enhancement EA and supporting documents, I have determined that the proposed actions are not major federal actions and would not significantly affect the quality of the human environment, individually or cumulatively with other actions in the general area. No site-specific environmental effects meet the definition of significance in context or intensity as defined in 40 CFR 1508.27. Therefore, supplemental or additional

information to the analysis done in the RMP/FEIS through a new environmental impact statement is not needed. This finding is based on the following information:

Context: Potential effects resulting from the implementation of the proposed actions have been analyzed within the context of the Salmon River-Siletz River (5th-field) Watershed and the project area boundaries. The proposed action would occur on approximately 172 acres of LSR and 17 acres of RR LUA land, encompassing less than one percent of the forest cover within the affected watershed [40 CFR 1508.27(a)].

Intensity:

1. The effects of *Projects 1 and 2* are unlikely to have significant adverse impacts on the affected elements of the environment [40 CFR 1508.27(b) (1)]. The affected elements common to all project areas are: hydrology (water quality, wetland/riparian zones, and other water resources), soils, wildlife (special status species, habitat, and structural components), air quality and fire hazard/risk, botany (special status species, invasive/nonnative species), fisheries [aquatic habitat and special status species], recreation and visual resources.

Design features were incorporated into the Proposed Actions for all project areas that would reduce the risk of adverse effects to the above resources (EA Section 2.2.2). These design features are proposed in order to meet the following objectives:

- To minimize soil productivity loss from soil compaction, slope stability or soil duff layer resulting from ground-based and skyline logging operations;
- To protect other components of hydrologic functions (channels, flows, water quality);
- To protect and enhance stand diversity, wildlife habitat and structural components;
- To protect against expansion of invasive and non-native plant species;
- To protect the residual stand;
- To protect BLM Special Status plant and animal species;
- To reduce potential hazards to recreation and visual resource areas;
- To reduce fire hazard risk and protect air quality;
- To protect cultural resources.

As a result of implementing the project design features described in EA Section 2.2.2, potential effects to the affected resources from thinning activities and connected actions in all project areas are anticipated to be site-specific or not measurable (i.e. undetectable over the watershed, downstream, or outside of the project area) [40 CFR 1508.27(b) (1), - EA Section 3.2].

2. *Projects 1 and 2* would not affect:
 - ✓ Public health or safety [40 CFR 1508.27(b)(2)];
 - ✓ Unique characteristics of the geographic area [40 CFR 1508.27(b)(3)] because there are no historic or cultural resources, parklands, prime farmlands, wild and scenic rivers, wilderness, or ecologically critical areas located within the project area (EA Section 3.1);
 - ✓ Districts, sites, highways, structures, or other objects listed in or eligible for listing in the National Register of Historic Places, nor would the proposed actions cause loss or destruction of significant scientific, cultural, or historical resources [40 CFR 1508.27(b)(8)] (EA Section 3.1).
3. *Projects 1 and 2* are not unique or unusual. The BLM has experience implementing similar actions in similar areas without highly controversial [40 CFR 1508.27(b) (4)], highly uncertain, or unique or unknown risks [40 CFR 1508.27(b) (5)].
4. *Projects 1 and 2* do not set a precedent for future actions that may have significant effects, nor do they represent a decision in principle about a future consideration [40 CFR 1508.27(b) (6)]. The BLM has experience implementing similar actions in similar areas without setting a precedent for future actions.
5. The interdisciplinary team evaluated *Projects 1 and 2* in context of past, present and reasonably foreseeable actions [40 CFR 1508.27(b)(7)]. Potential cumulative effects are described in the attached EA. These effects are not likely to be significant because of the projects' scope (effects are likely to be too small to be detectable), scale (project areas of 161, 24, and 4 acres, encompassing less than one percent of the forest cover within the Salmon River-Siletz River Watershed, and short duration (direct effects would occur over a maximum period of 10 years) (EA Section 3.2).
6. *Projects 1 and 2* are not expected to adversely affect threatened or endangered species, or their habitat, under the Endangered Species Act (ESA) of 1973 [40 CFR 1508.27(b)(9)].

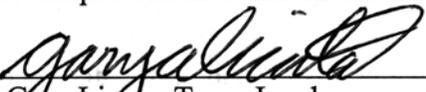
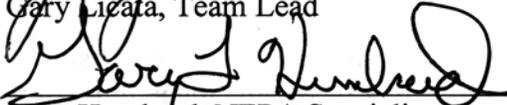
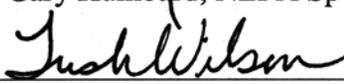
U. S. Fish and Wildlife Service (USFWS)

To address concerns for potential effects to listed wildlife species and potential modification of critical habitats, the proposed action was consulted upon with the USFWS, as required under Section 7 of the Endangered Species Act. Consultation for this proposed action was facilitated by its inclusion within a programmatic Biological Assessment (BA) that analyzed all projects that may modify the habitat of listed wildlife species on federal lands within the Northern Oregon Coast Range during fiscal years 2009 and 2010. The proposed action has been designed to incorporate all appropriate design standards set forth in the BA. This action would be considered a “may affect, not likely to adversely affect” northern spotted owl dispersal habitat and northern spotted owl and marbled murrelet critical habitats. In the resulting Letter of Concurrence (FWS Reference Number 13420-2008-I-0125), after reviewing the effects of the proposed action on the spotted owl and its critical habitat, and the marbled murrelet and its critical habitat, the USFWS concurred with BLM that the activities, as proposed, are not likely to adversely affect spotted owls or marbled murrelets and are not likely to adversely affect critical habitat for either species.

Consultation with NOAA NMFS is required for all actions which 'may affect' ESA listed fish species and critical habitat. The area where the proposed actions are located has two major stream systems (Salmon River and Siletz River). Oregon Coast coho salmon are listed as threatened under the ESA, as amended, and are known to occur in the Salmon and Siletz River systems. Proposed actions would comply with ESA Section 7 *Informal Consultation for the 2007-2009 Thinning Timber Sales Programmatic on the Mt. Hood and Willamette National Forests and portions of the Eugene and Salem Bureau of Land Management Districts, 20 Watersheds.*

Protection of Essential Fish Habitat (EFH) as described by the Magnuson/Stevens Fisheries Conservation and Management Act and consultation with NOAA NMFS is required for all projects which may adversely affect EFH of Chinook and coho salmon. The proposed Bottleneck LSR Enhancement Projects 1 and 2 are not expected to adversely affect EFH due to distance of all activities associated with the projects from occupied habitat. Consultation with NOAA NMFS on EFH is not required for these projects.

7. *Projects 1 and 2* do not violate any known federal, state, or local law or requirement imposed for the protection of the environment [40 CFR 1508.27(b)(10)].

Prepared by:	 Gary Licata, Team Lead	<u>02/23/09</u> Date
Reviewed by:	 Gary Humbard, NEPA Specialist	<u>2/20/09</u> Date
Approved by:	 Trish Wilson, Field Manager Marys Peak Resource Area	<u>3/3/09</u> Date

Glossary: Abbreviations, Acronyms, and Terms

ACS	Aquatic Conservation Strategy
Alternative	Proposed project (plan, option, choice)
Anadromous Fish	Species that migrate to oceans and return to freshwater to reproduce.
BLM	Bureau of Land Management
BMP	Best Management Practice(s) design features to minimize adverse environmental effects.
CEQ	Council of Environmental Quality, established by the National Environmental Policy Act of 1969
CEQ Regulations	Regulations that tell how to implement NEPA
Crown	That portion of a tree with live limbs.
Cumulative Effects	Past, present, and reasonably foreseeable effects added together (regardless of who or what has caused, is causing, and might cause those effects)
CWD	Coarse Woody Debris refers to a tree (or portion of a tree) that has fallen or been cut and left in the woods. Usually refers to pieces at least 20 inches in diameter as described in Northwest Forest Plan and FEMAT.
Deciduous Swamp	Shallow-water and/or waterlogged land dominated by deciduous trees.
Density Management	To change the structure, and possibly the composition and function, of a stand of trees by either increasing the number of trees per acre through planting, or by decreasing the existing tree density through cutting. Usually reserved for land-use allocations other than timber production.
DBHOB	Diameter Breast Height Outside Bark
EA	Environmental Assessment. NEPA document that describes a federal action(s) and analyzes the effects to the public and other agencies and tribes.
ESA	Endangered Species Act. Federal legislation that ensures federal actions would not jeopardize or elevate the status of living plants and animals.
FEIS	Final Environmental Impact Statement
FLPMA	Federal Land Policy Management Act
FONSI	Finding of No Significant Impact. NEPA document that describes why the proposed action within an EA would not significantly affect the quality of the human environment, individually or cumulatively.
Fuels	Any natural combustible material left on site that is available for burning
Ground-Base Yarding	Moving trees or logs by equipment operating on the surface of the ground to a landing where they can be processed or loaded
Harvester/Forwarder Equipment (cut to length system)	A logging system which uses "harvesters" to fell and delimb a tree and then cut it into logs, paired with a tracked "forwarder" that has a long reach, gathers up the logs and transfers them to a log truck. Many of these systems are known for their low PSI (pounds per square inch) impact to the ground.
Invasive Plant	Any plant species that is aggressive and difficult to manage.
Landing	Any designated place where logs are laid after being yarded and are

	awaiting subsequent handling, loading and timber hauling
LSR	Late-Successional Reserve (a NWFP land use allocation) Lands that are to be protected or enhanced for the purpose of providing habitat for older forest related species.
LSRA	Late-Successional Reserve Assessment for Oregon's Northern Coast Range Adaptive Management Area. Interagency document which facilitates appropriate management activities to meet LSR objectives in the project area.
LUA	Land Use Allocation. Lands designated using objectives as described in the NWFP.
LWD	Large Woody Debris; material found within the bankfull width of the stream channel and is specifically of a size 23.6 inches diameter by 33 feet length (per ODFW - Key Pieces)
MBTA	Migratory Bird Treaty Act of 1918, as amended
Native Plant:	Species that historically occurred or currently occur in a particular ecosystem and were not introduced
NEPA	National Environmental Policy Act (1969)
NMFS	National Marine Fisheries Service
NOAA	National Oceanic Atmospheric Administration. Federal agency which is responsible for the regulation of anadromous fisheries.
Non-Native Plant	Any species that historically does not occur in a particular ecosystem or were introduced
Non-Point	No specific site
Noxious Weed	A plant species designated by federal or state law as generally possessing one or more of the following characteristics: aggressive and difficult to manage; parasitic; a carrier or host of serious insects or diseases; or non-native, new, or not common to the United States.
NWFP	Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl and Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Related Species within the Range of the Northern Spotted Owl (1994) (Northwest Forest Plan).
ODEQ	Oregon Department of Environmental Quality
ODFW	Oregon Department of Fish and Wildlife
Oregon Smoke Management Plan	The State of Oregon's plan for implementing the National Clean Air Act in regards to burning of forest fuels
RMP	Salem District Record of Decision and Resource Management Plan (1995).
RMP/FEIS	Salem District Proposed Resource Management Plan / Final Environmental Impact Statement (1994).
Road Decommissioning	Road is closed to vehicular traffic. Road is waterbarred. May include removal of culverts, ripping and seeding of roadbed. Road prism remains intact for future use.
Road Improvement	Work done to an existing road which improves it over its original design standard. May include widening of subgrade, upgrading existing culverts, and applying rock surfacing that exceeds original design standards.
Road Renovation	Work done to an existing road which restores it to its original design

	standard. May include blading and shaping of a roadway, clearing brush from cut and fill slopes, cleaning or replacing culverts, and applying rock surfacing material to depleted surfaces. Generally these roads are driveable prior to work commencing.
ROD	Record of Decision
RR	Riparian Reserves (NWFP land use allocation) Lands on either side of streams or other water feature designated to maintain or restore aquatic habitat.
Rural Interface	BLM-managed lands within ½ mile of private lands zoned for 1 to 20 acre lots. Areas zoned for 40 acres and larger with homes adjacent to or near BLM-managed lands.
Skid Trails	Path through a stand of trees on which ground-based equipment operates.
Skyline Yarding	Moving trees or logs using a cable system to a landing where they can be processed or loaded. During the moving process, a minimum of one end of trees and logs are lifted clear of the ground
Snag	A standing dead tree
Special Status Species	Collectively, any plant or animal species which is federally listed or proposed for listing under the ESA, and BLM Sensitive species (BLM manual 6840 – Special Status Species Management).
SPZ	Stream Protection Zone is a buffer along streams where no material would be removed and heavy machinery would not be allowed. The minimum distance is 50 feet.
Succession	A predictable process of changes in structure and composition of plant and animal communities over time. Conditions of the prior plant communities that are favorable for the establishment of the next stage. The different stages in succession are often referred to as seral stages.
Turbidity	Multiple environmental sources which causes water to change conditions.
USDI	United States Department of the Interior
USEPA	United States Environmental Protection Agency
VRM	Visual Resource Management. Lands are classified from 1 to 4 based on visual quality ratings.
Wolf Tree	A tree within a forest stand that is significantly larger and more complex in structure than the average tree in the stand; usually because it was open-grown and therefore was not limited by competition for essential resources.
Yarding Corridors	Corridors cut through a stand of trees. Cables are strung in these corridors to transport logs from the forest to the landing.

**BOTTLENECK LATE SUCCESSIONAL RESERVE ENHANCEMENT
ENVIRONMENTAL ASSESSMENT**

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1.0 INTRODUCTION

1.1 Projects Analyzed

- Project 1, Mid-Seral Habitat Enhancement, is a proposal to cut and remove a portion of the trees, through a timber sale, on approximately 161 acres of 68 year old stands in Late Successional Reserve (LSR) and Riparian Reserve (RR) Land Use Allocations (LUAs) within the North Coast Range Adaptive Management Area.
- Project 2, Late-Seral Habitat and Deciduous Swamp Enhancement, is a proposal to create, within a 32 acre 103 year old stand, large, hard snags and coarse woody debris (CWD) structure and to release the largest live trees with the greatest crowns (wolf trees) from adjacent tree competition; and to maintain and enhance a 4 acre deciduous swamp by cutting and girdling encroaching conifers and hardwoods.

1.1.1 Relationship between Projects

Projects 1 and 2 are within the same section and are in the Salmon River-Siletz River Watershed.

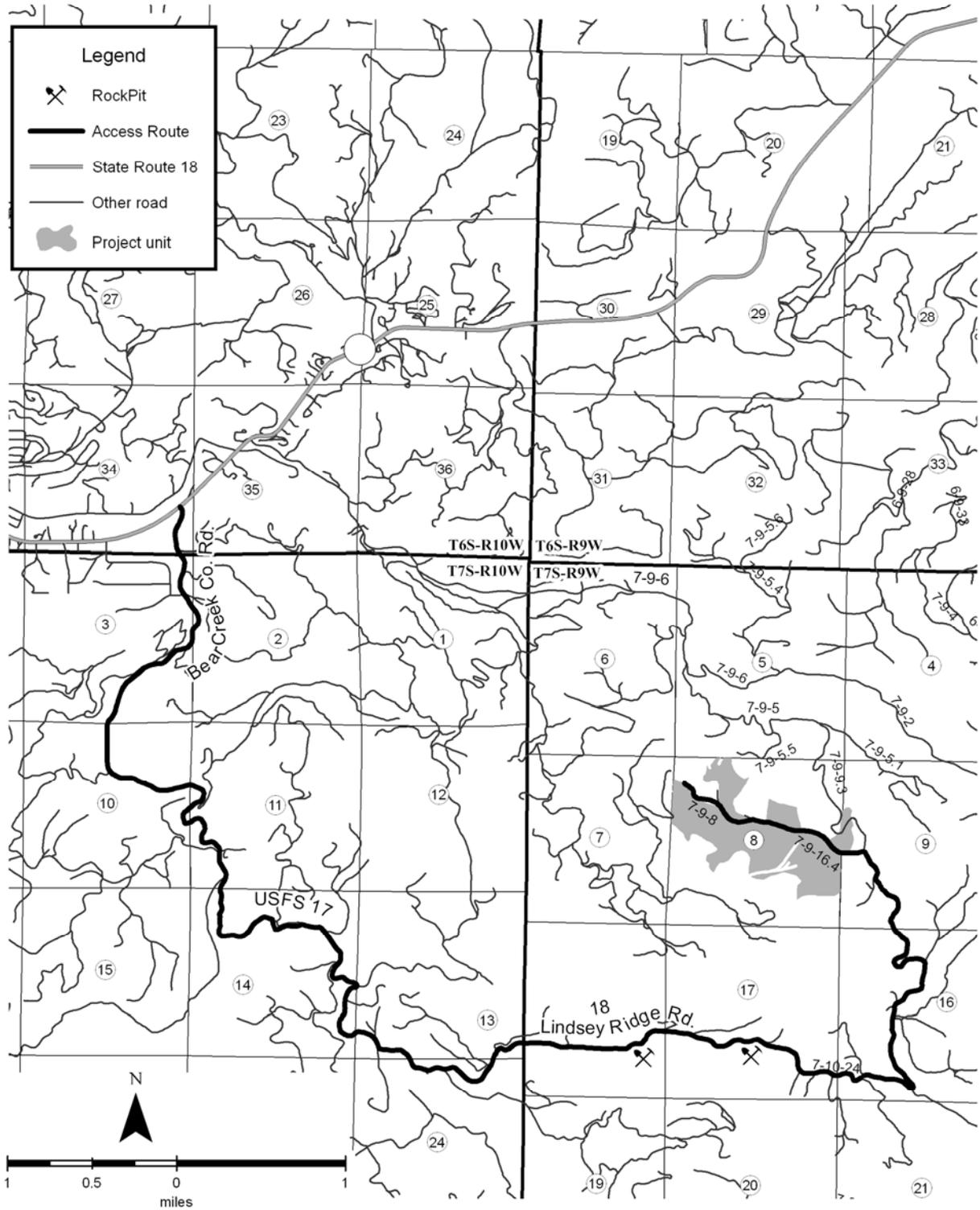
1.2 Project area Location

The projects are located approximately 10 miles east of Lincoln City, Oregon, in Lincoln County on forested land managed by the Marys Peak Resource Area (MPRA), Salem District of the Bureau of Land Management (BLM). They are within Township 7 South, Range 9 West, Sections 8 and 9, Willamette Meridian (see Map 1).

Map 1: Location Map

August 12, 2008

United States Department of the Interior BUREAU OF LAND MANAGEMENT BOTTLENECK LSR ENHANCEMENT LOCATION MAP T. 7 S., R. 9 W. - SALEM DISTRICT - OREGON



1.3 Conformance with Land Use Plans, Policies, and Programs

The Bottleneck Late-Successional Reserve Enhancement projects have been designed to conform to the following documents, which direct and provide the legal framework for management of BLM-managed lands within the Salem District:

- *Salem District Record of Decision and Resource Management Plan (RMP)*, May 1995: The RMP has been reviewed and it has been determined that the Bottleneck LSR Enhancement projects conform to the land use plan terms and conditions (i.e., complies with management goals, objectives, direction, standards and guidelines) as required by 43 CFR 1610.5 (BLM Handbook H1790-1).
- *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl and Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl* (the Northwest Forest Plan, or NWFP), April 1994.
- *Record of Decision To Remove the Survey and Manage Mitigation Measure Standards and Guidelines from Bureau of Land Management Resource Management Plans Within the Range of the Northern Spotted Owl* (July 2007) and Instruction Memorandum No. OR-2008-038 (Final State Director's Special Status Species List, February 2008). The decision is consistent with the Northwest Forest Plan, including all plan amendments in effect on the date of the decision. The EA analysis here tiers to that of the Northwest Forest Plan and supporting environmental impact statements in effect on the date of the decision.

The analysis in the Bottleneck LSR Enhancement EA is site-specific and supplements analyses found in the *Salem District Proposed Resource Management Plan/Final Environmental Impact Statement (RMP/FEIS)*, September 1994 and the 2007 *Final Supplement to the 2004 Final Supplemental Environmental Impact Statement to Remove or Modify The Survey and Manage Mitigation Measure Standards and Guidelines* (June 2007). The RMP/FEIS includes the analysis from the *Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl (NWFP/FSEIS)*, February 1994.

The proposed actions are located 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/directions found in the RMP were determined to be consistent with the Oregon Coastal Management Program.

The following documents provided additional direction in the development of the Bottleneck LSR Enhancement EA:

- *Late-Successional Reserve Assessment for Oregon's Northern Coast Range Adaptive Management Area (LSRA)*, see USDA-FS and USDI-BLM 1998);
- *Salmon-Neskowin Watershed Analysis (SNWA)*, see USDA-FS and USDI-BLM, 1999).

These documents are available for review in the Salem District Office. Additional information about the proposed actions is available in the Bottleneck LSR Enhancement Project EA Analysis File (NEPA file), also available at the Salem District Office.

1.4 Decision Criteria/Project Objectives for Each Project

The MPRA Field Manager will use the following criteria/objectives in selecting the alternative to be implemented. The field manager would select the alternative that would best meet these criteria. The selected action would:

- Meet the purpose and need of the projects (EA sections 1.6)
- Comply with the *Salem District Record of Decision and Resource Management Plan*, May 1995 (RMP) and related documents which direct and provide the legal framework for management of BLM-managed lands within the Salem District (EA section 1.3)
- Would not have significant impact on the affected elements of the environment beyond those already anticipated and addressed in the RMP EIS.

1.5 Results of Scoping

A scoping letter, dated October 11, 2007, was sent to 16 potentially affected or interested individuals, groups, and agencies. Two responses were received during the scoping period.

American Forest Resource Council

- *AFRC would like to see all timber sales be economically viable. Encourages the BLM to utilize appropriate harvesting systems and remove adequate volumes per acre while achieving LSR objectives.*
- *Seasonal restrictions have a cost to the Purchaser and result in a lower bid cost. AFRC would encourage the BLM to allow winter timber hauling since this would provide wood for the mills and work for the loggers during the winter months.*
- *The AFRC would like to see flexibility for fuels treatments. Rather than specifying a method of accomplishing resource objectives, BLM should identify objectives and any limitations to resource disturbance. The purchaser could then identify the method they could implement given their particular employee skills and equipment mix.*
- *The AFRC would like to see thinning treatments with smaller (25 to 50 feet) no cut buffers to achieve management objectives of moving the RR into Late-Successional forest faster. We encourage the BLM to maximize opportunities in the RR LUA.*

Oregon Wild

- *OW would be disappointed to see large trees cut in late-seral habitat in order to “release” other large trees.*
- *Thinning activities in Riparian Reserves should not result in yarding corridors, roads, or other activities impacting water quality and aquatic habitat.*
- *OW urges BLM to explore practices of variable density thinning for all stands to be treated, which allows young stands to develop into more complex and resilient forests.*
- *OW does not support new road construction when thinning in reserves.*
- *Conduct thinning without extensive construction of new roads; provide a stand by stand description of the road spur lengths and the acres each spur accesses for thinning.*
- *Special Status Species surveys must be completed prior to developing NEPA alternatives and before the decision is determined.*

- *Project analysis should separately discuss each of the Aquatic Conservation Strategy objectives.*
- *A full range of action alternatives should be considered for this project.*

1.6 Purpose of and Need for Action

The purpose for Projects 1 and 2 is to accelerate the development of late-seral/old-growth forest conditions in order to enhance terrestrial wildlife and aquatic habitats. The proposed action area was chosen for density management of forest stands to meet the future needs of marbled murrelet, northern spotted owl, and other species dependent upon late-seral/old-growth forest habitats; and for improvement to the watershed and road system.

The proposed projects are intended to implement a subset of specific management opportunities that were identified within the *Salmon-Neskowin Watershed Analysis* (USDA FS and USDI BLM, June 1999) and the *Late-Successional Reserve Assessment for Oregon's Northern Coast Range Adaptive Management Area* (USDA FS and USDI BLM, January 1998) in a manner consistent with standards and guidelines described below.

Late Successional Reserve LUA (RMP pp. 15-19): To manage developing forest stands and wildlife habitat in the LSR LUA so that:

- Late-successional forest conditions, which serve as habitat for late-successional forest species, can be developed, accelerated, and enhanced, (LSRA, p. 2).
- Plan and implement silvicultural treatments inside Late-Successional Reserves that are beneficial to the creation of late-successional habitat (RMP p. 16). This implementation would be accomplished through a timber sale that can be successfully offered to the market place.
- To enhance and maintain biological diversity and ecosystem health in order to contribute to healthy wildlife populations (RMP p. 24).

To manage early to mid-seral stands in Riparian Reserve LUAs (RMP pp.9-15) so that:

- Growth of trees can be accelerated to restore large conifers to Riparian Reserves (RMP p.7);
- Habitat (e.g. CWD, snag habitat, in-stream large wood) for populations of native riparian-dependent plants, invertebrates, and vertebrate species can be enhanced or restored (RMP p.7);
- Structural and spatial stand diversity can be improved on a site-specific and landscape level in the long-term (RMP p.11, 26, D-6).

To maintain and develop a safe, efficient and environmentally sound road system (RMP p.62) that:

- Provides appropriate access for timber harvest and silvicultural practices used to meet the objectives above;
- Reduces potential human sources of wildfire ignition and provides for fire vehicle and other management access;
- Reduces environmental effects associated with identified existing roads within the project area.

2.0 Alternative Development

Pursuant to Section 102 (2) (E) of the National Environmental Policy Act (NEPA) of 1969, as amended, federal agencies shall “Study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources.” No unresolved conflicts were identified. Therefore, this EA will analyze the effects of Alternative 1 (No Action) and Alternative 2 (Proposed Action).

2.1 Alternative 1 (No Action)

The BLM would not implement any of the projects at this time. This alternative serves to set the environmental baseline for comparing effects to the proposed action.

2.2 Alternative 2 (Proposed Action)

Project 1 (Mid-Seral Habitat Enhancement) Description

This project consists of density management treatments on approximately 161 acres of 68 year old stands within LSR and RR LUAs and would occur through a timber sale (Bottleneck Timber Sale). The stands would be thinned to a variable density basal area ranging from 110 to 160 square feet/acre. Trees would be skyline yarded on approximately 90 acres and ground-based yarded on approximately 71 acres.

Habitat within these mid-seral stands would be further enhanced by releasing approximately one wolf tree (larger green trees that have a complex live-crown structure) per acre from adjacent tree competition. A small gap or patch (up to 0.25 acre) would be created around each wolf tree and two of the adjacent Douglas-fir trees would be left on site within each gap; one of the trees would be girdled for snag habitat and the other left for cwd. This treatment will further increase structural complexity (live, dead, horizontal, and vertical) within the thinned stands.

Project 1 (Mid-Seral Habitat Enhancement) Only Connected Actions

- **Road Construction:** Approximately 5000 feet of new road would be constructed with road locations being primarily ridge top. All new roads would be surfaced with rock. All of the new construction would be decommissioned (waterbars installed, grass seed applied to exposed soil on cut/fill slopes and entrances blocked).
- **Road Renovation:** Roads utilized for log timber haul would be renovated as necessary. Road renovation could include surface rock application, road blading, roadside brushing and culvert cleaning and/or improvement.
- **Rock Quarry:** To supply rock for Project 1, an existing rock source (Lindsey Ridge Quarry) located in Township 7 South, Range 9 West, Section 17 would be utilized.

Table 1. Summary of Project 1 Activities

Activity	Project 1 Alternative 2 (Proposed Action)
Ground-based yarding (acres)	90
Skyline yarding (acres)	71
Road construction (feet)	5348
Road renovation (miles)	8
Mid-seral habitat enhancement (acres)	161
Later-seral habitat enhancement (acres)	24
Deciduous Swamp enhancement (acres)	4

Project 2 (Late-Seral Habitat and Deciduous Swamp Enhancements) Description

This project proposes to enhance a 32 acre late-seral (103 years old) stand, and a 4 acre deciduous swamp, both adjacent to the mid-seral forest of Project 1. Habitat within the late-seral stand would be enhanced by increasing structural complexity through selective cutting and girdling around existing large green trees which exhibit complex crown structure (wolf trees). Approximately 25 trees would be selected for release and all cut trees would remain on site. The objective for the deciduous swamp is to maintain and improve the habitat by cutting or girdling an undetermined number of encroaching conifers and hardwoods. All cut trees would remain on site.

2.2.1 Proposed Action Design Features (Project 1 Only)

The following design features are those specific means, measures, or practices that make up the proposed action, and those that are incorporated into the proposed action to reduce or eliminate risk to the affected elements of the environment described in EA Section 3.1.

Table 2. Season-of-Operation or Operating Conditions

Season-of-Operation or Operating Conditions	Applies to Operation	Objective
During periods of low tree sap flow, generally July 15-April 15	Yarding outside of road right-of-ways in commercial thinning and density management areas (cable)	Protecting the bark and cambium of residual trees
During periods of low precipitation, generally May 1-October 31	Road construction/renovation/decommissioning	Minimize soil erosion
During periods of low soil moisture, generally July 15-October 15	Ground-based yarding (Tractor)	Minimize soil erosion/compaction

During periods of low soil moisture, generally June 15-October 31	Ground-based yarding (Harvester/Forwarder; Hydraulic Loader) and machine chipping and/or piling	Minimize soil erosion/compaction
July 1 – September 15	In-stream work period (culvert cleaning/improvement)	Minimize soil erosion/stream sedimentation

Project Design Features by RMP Objectives

To minimize soil erosion as a source of sedimentation to streams and to minimize soil productivity loss from soil compaction, loss of slope stability or loss of soil duff layer:

- All logging activities would utilize the Best Management Practices (BMPs) required by the Federal Clean Water Act (as amended by the Water Quality Act of 1987) (RMP Appendix C pp. C-1 through C-7).
- Ground-based yarding equipment could be utilized as long as it meets BMPs and results in equivalent or less than the level of impacts analyzed for the project while meeting the requirements for soil listed in the RMP.
- Ground-based yarding would take place generally on slopes less than 35 percent.
- After operations, skid trails would be waterbarred where they are determined to be necessary by the contract administrator and blocked where they meet timber haul roads.
- In the skyline yarding area, one end suspension of logs would be required over as much of the area as possible to minimize soil compaction, damage to reserve trees, and disturbance.
- To minimize water quality impacts, the purchaser would also be required to install silt fences, barkbags, or additional road surface rock at the direction of the contract administrator. During periods of heavy rainfall, the contract administrator would restrict log timber hauling where the road surface is rutted or covered by a layer of mud and where runoff from that road segment is causing a visible increase in turbidity to adjacent streams.
- Existing landings less than 200 feet from streams channels would be disconnected to stream channels or mitigations would be implemented to avoid connecting existing landings to streams.
- Rock quarry operations would avoid sediment and contaminant delivery to any stream channels.

To contain and/or reduce noxious weed infestations on BLM administered lands using an integrated pest management approach:

- All soil disrupting equipment moved into the project area from outside the north and central Oregon Coast Range Physiographic Province (see map in Appendix A) or moved into the project area from known Oregon Department of Agriculture "A" designated weed infestation areas would be required to be clean of dirt and vegetation as directed by the contract administrator.
- All locations where mineral soil is exposed (roads to be constructed, skid trails and landings, culvert replacements) would be sown with Oregon Certified (blue tagged) red fescue (*Festuca rubra*), and/or sown with a wildlife vegetation mix and applied at a rate equal to 40 pounds per acre or sown/planted with other native species as approved by the resource area botanist.

To meet the objectives of the Aquatic Conservation Strategy (ACS) Component #1 (Riparian Reserves):

- Stream protection zones (SPZs), where no cutting is permitted, would be established along all streams and identified wet areas within the harvest area. These zones would be a minimum of 55 feet from the high water mark. Stream protection zone width would be established through shade sufficiency analysis (Silviculture Prescription Appendix 4).
- To protect water quality, all trees within one tree height of SPZs would be felled away from streams. Where a cut tree does fall within a SPZ, the portion of the tree within the SPZ would remain in place.
- No yarding would be permitted in or through any SPZs within the harvest area.
- From the SPZ to the upper edge of the RR LUA, stand density would be reduced using the same prescription used on the upland forest, though additional trees would be left as necessary to maintain 50 percent canopy cover in the secondary shade zone (one site potential tree height).
- No refueling would be allowed within 200 feet of any standing or running water (RMP, BMP C-8, C-6)
- Woody material removed from stream crossing for culvert maintenance would be retained in the stream network.
- Stream crossing replacement on perennial streams would be avoided within 1 mile of listed fish habitat (LFH) and on intermittent streams within ½ mile of LFH.

To protect and enhance stand-structure diversity:

- To create variable density, the treatment area would be divided into 6 units of about 16 to 30 acres each, and each would have a prescribed average residual basal area target. Residual tree densities would range from 110 to 160 square feet basal area and approximately 44 to 66 trees per acre (TPA). Within each unit, residual basal area would be varied above or below the set average, to give fine-scale variability. Furthermore, existing variability would be maintained by removing a proportion of the basal area.
- Except in yarding corridors/skid trails and gaps, minor species abundance would be increased by reserving all trees (merchantable and non merchantable) other than Douglas-fir.
- Clumps would be retained through variable density thinning, and would not exceed 0.1 acre in size. However, several areas would remain untreated due to logging infeasibility and SPZs.
- Seven “plus” trees (trees selected for genetic traits) and their reference trees, and bearing trees would be reserved.
- Existing hardwood species stand diversity would be maintained.

To protect and enhance wildlife habitat components:

- Any tree found to have a stick or ball nest, regardless of size (tree or nest), would be reserved.
- Any tree found to have unusual structural attributes (when compared to the average tree in the stand), such as larger trees with open-grown full crowns or natural platforms, would be reserved.
- Any tree found to have deformities, such as broken tops, multiple tops, or cavities, would be reserved.

- Existing snags and CWD would be reserved, except where they pose a safety risk or affect access and operability. Any snags or logs felled or moved for these purposes would remain on site within the project area.
- Additional trees would be reserved around large (greater than 24 inches DBHOB and 50 feet in height) snags to protect them from logging operations and reduce the likelihood of their removal for worker safety reasons.
- At least 2 green trees/acre intended to be part of the residual stand would be felled/girdled/topped to function as snags and CWD within five years post-harvest. Trees to be utilized for snag and CWD creation would be stand average diameter breast height outside bark (DBHOB) or larger. Incidentally felled or topped trees (ie. tail-trees, intermediate supports, guyline anchors, hang-ups, etc.) that may be left by harvest operations would be counted toward this target. The high likelihood of post-harvest windthrow in this project area is anticipated to provide most of the CWD to meet this target.
- Further monitoring and potential enhancement of snags and CWD would occur within the proposed project approximately five years after treatments are completed.

To reduce fire hazard risk and protect air quality:

- Whenever possible, alternative waste recycling of slash material would be encouraged. This may be accomplished by: providing firewood to the public, chipping for co-gen power production, chipping for soil amendments and soil protection, etc.
- Light accumulations of debris cleared during road construction and along roads that would remain in drivable condition following the completion of the project would be scattered along the length of rights-of-way.
- Large accumulations of debris on landings and along existing roads that remain in drivable condition would be machine and/or hand piled. Within 30 feet of the edge of each landing and road, all logs, tops, and debris would be decked or windrowed as directed by the contract administrator (except for logs sold and removed from the project area).
- All piles would be located at least ten feet away from reserve trees and snags. Larger piles would be preferable over small piles. Wind rows would be avoided unless approved by the contract administrator.
- During the late summer and before the onset of fall rains all machine and hand piles to be burned would be covered at least 80 percent with 4 mil black polyethylene plastic.
- All burning would occur under favorable smoke dispersal conditions in the fall, in compliance with the Oregon State Smoke Management Plan (RMP pp. 22, 65).
- Fuels treatment of any kind would be prohibited within SPZs.
- Hand piling of fuels intended for burning would be prohibited within 100 feet of any stream channel.
- Mechanical fuels treatment would be prohibited closer than 200 feet from any stream channel.

To Protect Special Status (SS) Species:

- The resource area biologist or botanist would be notified if any animal or plant SS species are found occupying stands proposed for treatment during project activities. If the species is a federal listed ESA species then all of the known sites would be withdrawn from any timber harvesting activity. If the species is other than a federal listed ESA species, then appropriate mitigation action would be taken.

To Protect Cultural Resources:

The project area occurs in the Oregon Coast Range. Survey techniques are based on those described in Appendix D of the *Protocol for Managing Cultural Resource on Lands Administered by the Bureau of Land Management in Oregon*. Post-project survey would be conducted according to standards based on slope defined in the Protocol appendix. Ground disturbing work would be suspended if cultural material is discovered during project work until an archaeologist can assess the significance of the discovery.

Proposed Action Design Features (Project 2 Only)

- In order to minimize the disturbance to nesting birds all treatment activities would be conducted after August 31 and before February 1.
- Red tree vole surveys would be conducted around each wolf tree before adjacent trees are cut or girdled. If any tree is found to have an active stick nest appropriate mitigation measures would be taken to protect the site.
- Once wolf trees are selected for the release treatment, site management of any botanical and fungal SS species found as a result of inventories would be accomplished in accordance with, BLM Manual 6840- *Special Status Species Management* and the *Record of Decision, To Remove the Survey and Manage Mitigation Measure Standards and Guidelines from Forest Service and Resource Management Plans Within the Range of the Northern Spotted Owl* (July 2007).
- The resource area biologist or botanist would be notified if any animal or plant SS species are found occupying stands proposed for treatment during project activities. If the species is a federal listed ESA species then all of the known sites would be withdrawn from any timber harvesting activity. If the species is other than a federal listed ESA species, then appropriate mitigation action would be taken.

2.3 COMPARISON OF ALTERNATIVES WITH REGARD TO PURPOSE AND NEED

Table 3. Comparison of Alternatives by Purpose and Need

Purpose and Need (EA Section 1.6)	No Action (Alternative 1)	Proposed Action (Alternative 2)
Accelerate the development of late-seral/old-growth forest characteristics in mid and late-successional forest habitat for the future needs of northern spotted owls, marbled murrelets and other species which depend upon late-seral/old-growth habitat. (RMP pp. 15-19)	Maintains the slow level of growth in overstocked mid-seral habitat for the next decade or two; existing wolf trees lose structure to competition; no immediate addition of snags and CWD. In the late-seral stand existing wolf trees lose structure to competition; no immediate addition of snags and CWD.	Creates a more open and faster growing mid-seral forest with variable tree densities; protects and enhances structure of wolf trees; creates hard snags and CWD.
Offer a marketable timber sale. (RMP pp. 15-19)	Would not offer timber for sale.	Offers approximately 161 acres of timber for sale.
Increase structural diversity in the Riparian Reserve LUA from	Maintains a highly dense, uniform stand of trees with	Reduces tree densities within stands to increase diameter

Purpose and Need (EA Section 1.6)	No Action (Alternative 1)	Proposed Action (Alternative 2)
relatively uniform conifer stands. (RMP pp. 9-15)	receding crown ratios, loss of limbs and loss of growth.	growth and restore large conifers to Riparian Reserves. Increases species diversity of native riparian-dependent plants and animals.
Provides appropriate access for timber harvest and silvicultural practices used to meet the objectives above, while minimizing increases in road densities. (RMP p. 62)	Maintain existing road densities.	Constructs approximately 5000 feet of new roads and renovates approximately eight miles. Following harvest, the new construction would be decommissioned.
	Delay maintenance on feeder roads, main routes would be maintained.	Would implement maintenance on feeder roads, allowing for continued access.
Reduces environmental effects associated with existing roads within the project area (RMP p. 62)	Maintain existing drainage and road surface conditions.	Renovates existing roads (includes drainage structure renovation or replacement). These renovations would improve drainage and road surface conditions, resulting in less road surface erosion into the streams.
Maintain and enhance biological diversity and ecosystem health in order to contribute to healthy wildlife populations (RMP p.24)	Deciduous swamp continues to see conifer encroachment from surrounding forest with potential to decrease in size over time; no input of new hard snags and CWD.	Encroachment of conifer trees into deciduous swamp site from surrounding forest is suppressed through the cutting and girdling of invading trees; new input of hard snags and CWD.

2.4 Alternatives Considered but not Analyzed in Detail

Helicopter logging:

An alternative to harvest some of the treatment area in Project 1 with a helicopter was considered and analyzed. It was determined that the sale should be conventionally harvested due to the high cost of helicopter use in conjunction with current value of Douglas-fir and western hemlock. All new construction would occur within ridge top road locations in areas of non-sensitive soils. In addition, helicopter yarding is typically utilized in areas where timber harvest operations are inaccessible due to a lack of roads, in areas of sensitive soils or where adverse impacts to fisheries would occur. None of these conditions exist within the Bottleneck LSR Enhancement Project areas.

Inclusion of additional density management area:

One alternative included a 16 acre unit for skyline yarding in Section 9. A considerable amount of new road construction would be necessary to conventionally harvest the unit so it

was dropped from this action and will be considered as a future action which includes helicopter logging of similar stands in the area.

Alternate Haul Route:

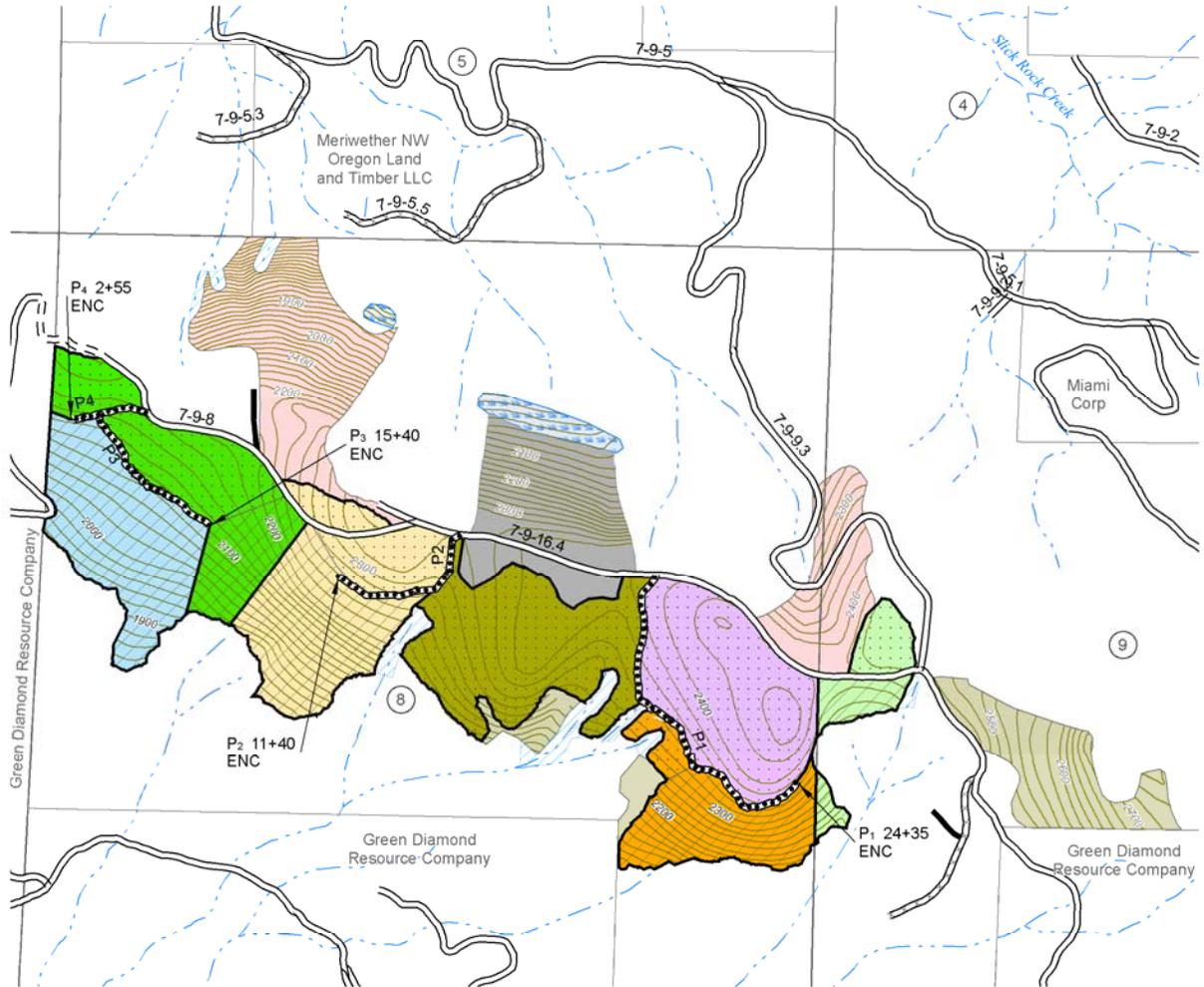
An alternate timber haul route (Roads 7-9-6, 7-9-5 and 7-9-9.3) was considered and analyzed. The current poor condition of these roads would have required extensive road renovation work prior to timber hauling. Due to the large amount of road renovation and considerable expenses that would have been required, this haul route was not selected.

Map 2 Proposed Action Alternative

United States Department of the Interior - BUREAU OF LAND MANAGEMENT

Bottleneck LSR Enhancement EA MAP

T. 7 S., R. 9 W., Sections 8 & 9, W. M. - SALEM DISTRICT - OREGON



- | | | |
|-------------------------------------|---|---|
| Existing Road | Project 1: Mid-Seral Habitat Enhancement | Ground-Based Yarding |
| Jeep or Dirt Road | Unit 8A - 24 acres | Skyline Yarding |
| Overgrown or Impassable Road | Unit 8B - 24 acres | Road to be Constructed and Decommissioned |
| Decommissioned Road | Unit 8C - 29 acres | Project 2 |
| Fishbearing Stream | Unit 8D - 30 acres | Late-Seral Enhancement - 24 acres |
| Non-fishbearing stream | Unit 8E - 17 acres | Deciduous Swamp Enhancement - 4 acres |
| Stream Protection Zone | Unit 8F - 28 acres | |
| Deferred - Helicopter Logging | Unit 9A - 9 acres | |
| Silviculturally deferred due to age | | |

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data. Data was compiled from multiple sources and may not meet U.S. National Mapping Accuracy Standard of the Office of Management and Budget.



November 18, 2008

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS– COMMON TO BOTH PROJECT AREAS

3.1 Identification of Affected Elements of the Environment

The interdisciplinary team reviewed the elements of the human environment, required by law, regulation, Executive Order and policy, to determine if they would be affected by the proposed action. Table 4 Critical Elements of the Human Environment and Table 5 Other Elements of the Environment summarize the results of that review. Affected elements are **bold**. All entries apply to the proposed action, unless otherwise noted.

Table 4 Critical Elements of the Human Environment (BLM H-1790-1, Appendix 5) for both projects

Critical Elements Of The Human Environment	Status: (Not Present, Not Affected, or Affected)	Do these projects contribute to cumulative effects? Yes/No	Remarks
Air Quality (Clean Air Act)	Affected	No	Addressed in text (EA Sections 3.2.6 and Bottleneck LSR Enhancement Project Proposal Fuels Report pp. 1-10).
Areas of Critical Environmental Concern	Not Present	No	
Cultural Resources	Not Affected	No	Cultural resource sites in the Oregon Coast Range, both historic and prehistoric, occur rarely. The probability of site occurrence is low because the majority of BLM-managed land. Oregon Coast Range land is located on steep upland mountainous terrain that lack concentrated resources humans would use. Post-disturbance inventory would be completed on slopes less than 10 percent.
Energy (Executive Order 13212)	Not Affected	No	There are no known energy resources located in the project areas. The proposed actions would have no effect on energy development, production, supply or distribution.
Environmental Justice (Executive Order 12898)	Not Affected	No	The proposed actions are not anticipated to have disproportionately high or adverse human health or environmental effects on minority populations or low-income populations.
Prime or Unique Farm Lands	Not Present	No	

Flood Plains (Executive Order 11988)		Not Affected	No	The proposed action does not involve occupancy or modification of floodplains, and would not increase the risk of flood loss.
Hazardous or Solid Wastes		Not Present	No	
Invasive, Nonnative Species (plants) (Executive Order 13112)		Affected	No	Addressed in text (EA Section 3.2.1 and Botanical Report Bottleneck pp. 1-12).
Native American Religious Concerns		Not Affected	No	No Native American religious concerns were identified during the public scoping period.
Special Status Species or Habitat	Fish	Affected	No	Addressed in text (EA Section 3.2.5 and Bottleneck Fisheries Report pp. 1-20).
	Plant	Not Present	No	
	Wildlife (including designated Critical Habitat)	Affected	No	Addressed in text (EA Sections 3.2.2 and Biological Evaluation pp. 1-11).
Water Quality (Surface and Ground)		Affected	No	Addressed in text (EA Section 3.2.4 and Hydrology/Channels/Water Quality Addendum for Bottleneck Project pp. 1-16).
Wetlands (Executive Order 11990)		Not Affected	No	Wetlands would be designated as SPZs and buffered out of the treatment areas. (Bottleneck Project Silvicultural Prescription: Including Upland and Riparian Reserves in NEPA file).
Wild and Scenic Rivers		Not Present	No	
Wilderness		Not Present	No	

Table 5. Other Elements of the Environment for Both Projects

Other Elements of the Environment	Status: (i.e., Not Present, Not Affected, or Affected)	Do these projects contribute to cumulative effects? Yes/No	Remarks If not affected, why?
Fire Hazard/Risk	Affected	No	Addressed in text (EA Sections 3.2.6 and Fuels Report Summary Bottleneck LSR Enhancement Project Proposal Fuels Report pp. 1-10).
Essential Fish Habitat	Affected	No	Addressed in text (EA Sections 3.2.5 and Bottleneck Fisheries Report pp. 1-20).
Land Uses (right-of-ways, permits, etc)	Not Present	No	
Late Successional and Old Growth Habitat	Not Present	No	
Mineral Resources	Not Present	No	
Recreation	Affected	No	Addressed in text (EA Sections 3.2.7 and Recreation/Rural Interface/VRM Report pp. 1-9).
Rural Interface Areas	Not Present	No	
Soils	Affected	No	Addressed in text (EA Sections 3.2.3 and Soils Environmental Assessment for the Proposed Bottleneck Projects Report pp. 1-15).
Special Areas outside ACECs (Within or Adjacent) (RMP pp. 33-35)	Not Present	No	
Visual Resources	Affected	No	Addressed in text (EA Sections 3.2.7 and Recreation/Rural Interface/VRM Report pp. 1-9).
Water Resources – Other (303d listed streams, DEQ 319 assessment, Downstream Beneficial Uses; water quantity, Key watershed, Municipal and Domestic)	Affected	No	Addressed in text (EA Sections 3.2.4 and Hydrology/Channels/Water Quality Addendum for Bottleneck Project pp. 1-16).
Wildlife Structural or Habitat Components - Other (Snags/CWD/ Special Habitats, road densities)	Affected	No	Addressed in text (EA Sections 3.2.2 and Biological Evaluation pp. 1-10).

3.2 Affected Environment and Environmental Effects

Those elements of the human environment that were determined to be affected are *vegetation, wildlife, soils, water, fisheries/aquatic habitat, fuels/air quality and recreation/visual resources*. This section describes the current condition of those affected elements, and the environmental effects of the alternatives on those elements.

3.2.1 Vegetation

(IDT Reports incorporated by reference: Bottleneck Project Botanical Report pp. 1-12, Bottleneck Silvicultural Prescription and Riparian Report pp. 1-25)

Affected Environment

Mid-Seral Habitat Enhancement (Project 1) and Late-Seral Habitat and Deciduous Swamp Enhancements (Project 2)

Present Stand Condition and History

The Mid-Seral Habitat Enhancement project occur within a 68 year old coniferous forest that is comprised mainly of Douglas-fir (93 percent), western hemlock (6 percent), fewer Sitka spruce and sparse noble fir. It appears that a scattering of the Douglas-fir, Sitka spruce and western hemlock trees originated before the majority, as they are relatively large full-crowned and open-grown (wolf trees). There are almost 12 TPA greater than 24 inches diameter breast height outside bark (DBHOB). The understory is mainly open with few concentrations of vine maple and red huckleberry on sloped areas. Western hemlock seedlings are also common and often concentrated in small stands. The upper gentle slopes, mid-slope benches and ridges are mostly dominated by forbs, graminoids and widely spaced sword-fern. Steeper upper, mid and lower slopes are dominated by sword-fern and Oregon grape. In general, this project area is fairly uniform with little vegetative diversity when compared to multi-layered coniferous forested stands with less dense canopy cover. There are some areas with concentrations of bryophyte covered boulders. These areas would not be considered “unique” within the project area as these habitats are a common occurrence on the upper slopes and ridges throughout adjacent lands.

The Late-Seral Habitat Enhancement portion of Project 2 has stand conditions essentially the same as Project 1 with the exception that this stand is about 36 years older. It also has scattered older, bigger (height and diameter) conifers associated with the stand. These older trees are considered to be the first trees to become established on the site following a historical natural stand replacing event which took place over 100 years ago. The older trees tend to have complex crowns and large branches that extend from the canopy to near the ground. This stand is located on the upper gentle slopes and is surrounded on three sides by Project 1.

Table 6. Current stand attributes for Projects 1 and 2 (Stand exam data-2004).

Stand Exam Unit		STAND DATA					
Project 1							
<i>Species</i>	<i>Acres</i>	<i>Total age¹</i>	<i>Trees/ac</i>	<i>Basal area/ac²</i>	<i>DBHOB (in.)³</i>	<i>RDI⁴</i>	<i>Crown closure⁵</i>
Douglas-fir			226	331	16.4		
Western hemlock			15	18	15.0		
Sitka spruce			1	3	24.6		
Totals	161	68	242	353	16.4	1.02	79%
Project 2							
Douglas-fir			41	141	25.1		
Western hemlock			77	175	20.4		
Sitka spruce			0.9	6	36.0		
Western red cedar			0.3	2	37.0		
Totals	24	104	119	324	22.3	.69	75%

Values are for trees greater than 7 inches diameter in each stand.

¹ Stand age in 2009. Data collected in 2004. Unit M413 data grown forward to 2009 using Organon model.

² Basal area in square feet: cross-sectional area occupied by tree boles on each acre, a measure of density.

³ Average diameter at breast height (4.5 feet).

⁴ Relative Density Index, the density of TPA relative to the maximum density possible (Reineke, 1933).

⁵ Average crown closure, average of estimate on each plot by stand exam contractor.

The Deciduous Swamp Enhancement portion of Project 2 occurs on a mid-slope bench where there is shallow water for much of the year and forms the 'headwaters' of a first order stream which drains to the north. The water source of this area in the summer appears from several locations in the form of springs at the lower extent of the upslope conifer dominated slopes. The outer edge of the aquatic system is surrounded by western red cedar, Douglas-fir and red alders. Several red alder snags are present around the perimeter and within the aquatic system and are presumed to have died from past high water events. The aquatic system has an open canopy and has a heavy salmonberry component. There are several decay class 3 logs within the aquatic area, but many are red alders. Other species associated with this aquatic area are: skunk cabbage, gold thread, gold carpet, bishops-cap and pig-a-back plant.

Snag and CWD Conditions

Table 7 displays the volume of downed wood and snags per acre, and the count of snags and broken topped TPA in Project 1 area. Of the total, about 50 percent of the volume is in the 'hard' decay classes (class 1 and 2; see Figure 1 below), resulting from recent tree mortality and windthrow or *Phellinus weirii* root rot infection. Most of the snags that have died are a result of suppression from overtopping trees. Snags greater than 24 inches DBHOB have value for the greatest amount of wildlife species; there is an average of only 1.3 of these larger snags per acre, and they are all in decay class 5 (most decayed). About half of them are 50 feet or less in height.

Table 7. Current snag and CWD amounts¹ in Projects 1 and 2.

Project	Total age (yrs)	Down wood volume (cu ft/ac)	Down wood volume (%)	Snag Volume (greater than 5 inches DBHOB) (cu ft/ac)	Snag volume (%)	Total volume (cu ft/ac)	Snags per acre	Snag QMD	Broken Topped Live TPA
1	68	119	17%	589	83%	708	55	8.5	0
2	104			1443			46	13.0	

¹Conifer only; CWD over 8 feet long and 5 inches DBHOB; snags over 10 feet long and 5 inches DBHOB.

Figure 1. Snag and CWD Decay Class Condition Codes

					
Decay Class	1	2	3	4	5
Bark	Intact	Intact	Trace	Absent	Absent
Twigs	Present	Absent	Absent	Absent	Absent
Texture	Intact	Intact to soft	Hard, large pieces	Soft, blocky pieces	Soft, powdery
Shape	Round	Round	Round	Round to oval	Oval
Color of wood	Original	Original	Original to faded	Light brown to faded brown	Faded to light yellow or gray
Bole portion on ground	None, elevated on supports	Parts touch, still elevated	Bole on ground	Partially below ground	Mostly below ground

Using guidelines from the Late Successional Reserve Assessment for Oregon’s Northern Coast Range Adaptive Management Area, (p. 96), for Project 1 moderate levels of CWD (greater than 1100-1980 cubic feet per acre) are recommended for early or mid-seral stands.

Forest Health

There are no known current threats to forest health beyond the following endemic processes in the proposed project areas; laminated root rot, caused by the fungus *Phellinus weirii*, and Douglas-fir bark beetles. The risk of windthrow from severe winter storms always exists, and the upper lee slopes of major southeast to northwest-running ridges generally experience the highest degree of windthrow in the Oregon Coast Range.

Special Status Botanical and Fungal Species

Inventory of the Project 1 and 2 areas for vascular plant, lichen, bryophyte and fungal SS Species were accomplished through review of; 1) existing survey records and spatial data, 2) habitat evaluation and evaluation of species-habitat associations and presence of suitable or potential habitat, and 3) field clearances, field reconnaissance and inventories utilizing intuitive controlled surveys, in accordance with survey protocols for the specific groups of species. There are no “known sites” of any vascular plant, lichen, bryophyte or fungi SS Species within the project areas nor were any found during subsequent surveys.

Invasive (Noxious Weeds, Invasive Non-native Species)

The following noxious weeds are known from within or adjacent to the project area (mid and late-seral enhancements only; there are no noxious weeds that occur in the immediate area of the deciduous swamp site), Tansy ragwort, bull and Canadian thistles, St. John's wort, Himalayan blackberry, and Scot's broom.

Environmental Effects

3.2.1.1 Alternative 1 (No Action Alternative)

Mid-Seral Habitat Enhancement (Project 1)

Without treatment, natural disturbance agents such as disease, insects, and wind would create stand structural diversity and contribute to late-successional structural development. The timing and intensity of these conditions are unknown, but it is expected that diversity would take considerably longer to develop than if the proposed action was implemented.

Stand structural conditions would remain on the current trajectory of increasing density and decreasing individual tree growth rates. Stand growth projections for the next 30 years (using ORGANON version 7.0, a growth and yield computer simulation model; Hann, 2003) indicate that relative density would continue to maintain the current average in 30 years without treatment. The stand is currently at such high density, that continued mortality will occur, offsetting tree growth. Understory development would be very limited: few new understory trees would establish, and existing understory trees would die or slow in growth due to increasing competition.

Stand structure would remain relatively uniform, except for gaps created by disturbance. The main input of CWD would come from density mortality, disturbance events and endemic levels of insects and disease and would result in more numerous snags or downed logs than would occur with treatment. In general, the quantity of trees dying is expected to be much greater than if the stands were thinned, but dead trees would be smaller in size. On average, density mortality in trees of all sizes (including understory) is predicted (ORGANON) to average 70 TPA of about 11 inches DBHOB in the next 30 years, and only 0.10 TPA of 12 inches DBHOB with density management in that same time period. One 22 year study of stands aged 14 to 38 years, showed total annual stem mortality of 1 to 5 percent. Since the stands in the project area are older than the researched stands and have fewer TPA, annual mortality would likely be somewhat less. In the study, wind damage accounted for 18 percent of the stem mortality, but represented 50 percent of the bole biomass lost because mortality resulting from wind is relatively larger than density mortality (Lutz and Halpern, 2006).

As the canopy closes and lower limbs are lost to shading, crown ratios would decrease from the current average of 40 percent to less than 30 percent in 30 years. Relatively large, open-grown "wolf" trees would continue to lose lower crown due to competition from surrounding trees that established subsequent to them. Wind firmness and individual tree stability would also decrease.

There would be no short-term elevated risk of bark beetle infestation resulting from harvest, but risk of significant windthrow that could trigger bark beetle infestation would remain.

This alternative does not meet the objectives for speeding the development of late-successional forest structural characteristics in younger stands. Characteristics for the Project 1 stand and

treatment units for the next 30 years with and without treatment as projected by ORGANON are compared in Table 8.

Table 8 Average pre-treatment and post-treatment stand characteristics immediately after thinning stands in Bottleneck Project 1 (trees greater than 7” DBHOB only).

Unit / Treatment	Age ¹ (yrs)	Pre-treatment					Immediately After Treatment				
		TPA ²	% DF	BA ³ (sq ft)	QMD (in) ⁴	RDI ⁵	TPA ²	% DF	BA ³ (sq ft)	QMD (in) ⁴	RDI ⁵
Total Unit 140 BA avg.	68	242	93%	352	16.3	1.02	56	71%	139.0	21.4	0.36
Units 8B, 8E and 9A 160 BA	68	242	93%	352	16.3	1.02	66	76%	162.0	21.2	0.42
Units 8A and 8D 140 BA	68	242	93%	352	16.3	1.02	57	72%	142.0	21.4	0.37
Units 8C and 8F 110 BA	68	242	93%	352	16.3	1.02	44	64%	112.0	21.6	0.29
Avg	68	242	93%	352	16.3	1.02	56	72%	139	21.4	0.36

¹Total stand age in 2009 - 2004 data grown forward to 2009.

²Number of trees per acre. ³Basal area per acre.

⁴Diameter at breast height (4.5 feet) of tree of average basal area.

⁵Proportion of maximum Stand Density Index (Reineke 1933), as a ratio of trees in a given stand compared with the biological maximum number of trees a site can support.

Table 9 Project 1 Stand Characteristics with Treatment vs. No Treatment 30 years in the future (year 2039)¹

Stand or Unit	Treatment Residual BA	Age ¹ (yrs)	TPA ²	Percent D-Fir (TPA)	BA ³ (Sq.Ft.)	QMD (in.) ⁴	RD ⁵	Density Mortality		
								TPA	BA	QMD
Stand	No Tmt.	98	172	92%	385	20.3	1.03	70.00	50.00	11.4
Stand (Avg.)	140 BA	98	56	71%	217	26.9	0.52	0.10	0.08	12.5
Units 8B, 8E and 9A	160 BA	98	66	76%	244	26.0	0.59	0.10	0.11	12.4
Units 8A and 8D	140 BA	98	57	72%	222	26.8	0.53	0.10	0.08	12.7
Units 8C and 8F	110 BA	98	44	64%	186	27.9	0.44	0.10	0.05	12.3

¹Modeled from stand ages 2009 to 2039.

²Trees per acre greater than 7 inches DBHOB.

³Basal area in square feet: cross-sectional area occupied by tree boles on each acre, a measure of density

⁴QMD=quadratic mean diameter, the DBHOB of tree of mean basal area.

⁵Relative Density (RD) is a ratio of trees in a given stand compared with the number of trees a site can support.

Special Status Botanical and Fungal Species

Not affected, since no known sites exist within the project area.

Invasive (Noxious Weeds, Invasive Non-native Species)

Without any new human caused disturbances in the proposed project area the established noxious weed populations would remain at the current level (low).

Late-Seral Habitat and Deciduous Swamp Enhancements (Project 2)

No tree cutting/girdling would occur around large legacy trees. Tree competition would cause the lower crowns to be lost on the legacy trees, reducing their crown structure and wildlife value. No tree cutting/girdling would occur in the wet area, and successional change from open wetland habitat to forest would continue. Without cutting and girdling, there would not be a new impulse of hard snags and CWD in the stand and deciduous swamp.

3.2.1.2 *Alternative 2 (Proposed Action)*

Mid-Seral Habitat Enhancement (Project 1)

Stand Development

Stand development for 30 years growth after density management with and without treatment is compared in Table 8. Variable density thinning to the recommended densities is expected to put the stands on a trajectory toward development of stand structure and individual tree characteristics desirable for attainment of composition and structural diversity objectives in the LSRA and the Aquatic Conservation Strategy in the following ways:

Restored structural complexity of the stands

Tappeiner, et al (1997) concluded that thinning 40 to 100 year-old Douglas-fir stands in the Coast and Cascade ranges of western Oregon promotes tree regeneration, shrub growth, and multi-storied stand development, and thinning that incorporates retention of large remnant trees, snags, down wood, and hardwoods accelerate the development of old-growth characteristics. Treatment includes variable density thinning, creation of small gaps around “wolf” trees, and retention of small clumps. This would increase spatial and structural diversity of the stand. Some trees would experience no competition and grow very full crowns. Some trees would remain at close spacing and retain closed canopy conditions. Thinning around “wolf” or legacy trees in Projects 1 and 2 would increase growth and vigor of the remaining trees and prevent loss of lower crown due to competition.

Accelerated development of desired tree characteristics

Residual trees would increase in diameter and crown depth/width. The long-term results of density management would be larger average diameters and deeper crowns (higher crown ratios) at any given age. The predicted average increase in QMD for overstory trees as a result of density management thinning is 5.5 inches. (With thinning, the QMD would increase from the current of 16.4” to 21.4” from the removal of smaller trees, raising the mean QMD. With 30 years of growth, QMD would then increase from 21.4” to 26.9”, an increase of 5.5”). Without thinning, the average increase in QMD is predicted to be 4 inches (from 16.4 inches to 20.3 inches QMD). Density management would result in an additional 1.5 inch of diameter growth in 30 years, a 37 percent increase from no treatment.

Species Composition

Species abundance would change, as thinning would target Douglas-fir, increasing the relative proportion of the other tree species. The current weighted average species composition is 93 percent Douglas-fir, 6 percent western hemlock, less than 1 percent Sitka spruce, and a trace of noble fir. After treatment, the composition would be approximately 72 percent Douglas-fir, 26 percent western hemlock, two percent Sitka spruce and a trace of noble fir.

Maintenance of stand health and stability

Trees with less competition maintain deeper live crowns, lowering their center of gravity and decreasing their height/diameter ratios, reducing susceptibility to wind damage. Deep live crowns are also a structural attribute of late seral forest. Some researchers now suggest that wind firmness and individual tree stability may be factors in a tree reaching age 300 and over. With treatment, the current stand average height to diameter ratios of 81 would decline to an average of 59 after 30 years of growth indicating an improvement of tree stability over time.

Crown ratios below 30 percent indicate a stand is no longer suitable for density management, as the trees will likely not respond to more open conditions, and are more subject to wind throw if the stand is opened up. Crown ratios in the treatment stands are predicted to fall to an average of 24 percent within 30 years without treatment, but stay at about 40 percent in treated stands.

Long-term increase in quality CWD recruitment

Thinning short-circuits the snag recruitment that results from inter-tree competition (Carey, 1999), and very little density mortality (0.1 TPA) is expected to occur for 30 years after treatment. Measures to protect existing large snags are likely to be effective, but many of the smaller snags would likely be felled for safety reasons. Potential future treatments to create downed logs and snags would increase the number of snags and downed log volumes. Inputs would be of large diameter, created from average size of residual stand, and of decay class 1 material. Inputs resulting from harvest consist of limbs and tops, breakage and cull and incidentally felled or topped trees that would be left on site. The harvest input would likely result in a gain of 200 cubic feet per acre of CWD in skyline yarding areas (90 acres of the project area), and about 100 cubic feet per acre in ground-based yarding areas. In the long-term, due to increased diameter growth resulting from density management, larger trees would be available for recruitment for CWD.

There would be a short term (one to three years) elevated risk of a bark beetle infestation from the increased fresh down wood, resulting from both the logging operation and (10 years or more later) creation of additional snags and down wood. Tree mortality resulting from bark beetle infestation as a result of logging or CWD creation would be unlikely.

The potential for windthrow from winter storms would be higher for the first decade following density management. The risk is reduced in the design of the variable density thinning; the heavier residual densities are targeted for the areas that would be most vulnerable to prevailing winds. The risk would be further reduced by selecting leave trees with deep healthy crowns. Risk is greater near created openings (clearcuts on adjacent private lands), and where aspect (the lee side of ridges from prevailing winds), topography, and shallow soils increase risk. Windthrow is not expected to reduce tree stocking by more than 20 percent for the first decade after treatment over the treated area (Busby, Adler, Warren and Swanson, 2006). A two-year study of wind damage following variable density thinning (Roberts, et al., 2007), showed loss of 1.3 percent of stems. The study showed overall level of wind damage resulting from variable density thinning is not statistically greater than unthinned stands, nor uniform thinning.

Skyline and ground-based yarding systems would result in bole and crown damage to a small percentage of the residual trees. Damage may result in greater incidence of stem decays in the future, adding to late-successional structure and function. Burning of slash piles along roads and on landings could result in damage to the crowns of a few adjacent residual trees. Restrictions to yarding during the sap-flow period in the spring would reduce damage.

Effects within Riparian Reserves

Approximately 17 acres (or 15 percent) of the treatment area are within RR LUA. However, the habitat conditions within the RR LUA, outside the SPZ are essentially identical to habitat conditions within the uplands (outside of RR LUA). From the SPZ to the upper edge of the RR LUA, stand density would be reduced using the same prescription used on the upland forest. However, gaps would not be located within 100 feet from streams. Habitat for aquatic and riparian dependent species would be maintained or enhanced in RR LUA in the following ways:

Long-term increase in quality instream large woody debris (LWD) recruitment

In the long-term, trees would reach large diameters earlier compared to the no treatment option, creating natural opportunities for high quality LWD recruitment. As indicated in Table 8, average stand diameter reaches 20 inches years earlier than if the stands were not treated, and in fact would jump to over 20 inches with treatment itself, where it would take almost 30 years to reach that average without treatment. Large amounts of smaller wood would continue to fall from within the untreated SPZs, and larger wood would begin to be recruited from farther up the slopes as the treated stands reach heights of 200 feet. Thus, wood with a larger range of sizes would potentially be recruited into streams over the long-term in treated stands.

Maintenance of stream temperature through shading

Stream shading would not be affected by the proposed treatments. According to the Stream Shading Sufficiency Analysis (USDA Forest Service et al 2004) done for the proposed treatment (Silviculture Prescription Appendix 4), SPZs need to be 55 feet wide to provide critical shade in the primary shade zone, based on topography and average tree height. Additional criteria required for shade sufficient to maintain stream temperatures are that vegetation density is high and will benefit from thinning and that vegetation treatment in the secondary shade zone (from the primary shade zone to approximately one tree height from the stream) would not result in canopy reduction of more than 50 percent. Canopy cover may drop to about 45 percent in Units 8C and 8F (110 residual basal area) outside the secondary shade zone but future tree growth would result in recovery of canopy by 3 percent or more cover annually. Unit 8C has about 300 feet of stream frontage on one bank, and Unit 8F contains no streams. Understory establishment and growth would contribute to canopy cover as well.

Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands/ maintain restore habitat to support well-distributed populations of native species

Project 2 would maintain open wet meadow habitat, a rare component of the landscape that provides a specialized habitat niche for many species, rather than allowing succession to the more common closed forest habitat.

Special Status Botanical and Fungal Species

This project would not directly affect any SS vascular plant, lichen, bryophyte or fungi species since there are no known sites within or adjacent the project area. However, this action could provide positive effects for these species. Thinning dense conifer stands could provide habitat for SS botanical and fungal species known from forests with larger diameter trees at an earlier age since thinning dense stands can provide an increase in secondary conifer growth and allow for an increase in diversity and density of the existing shrub and forb species.

This project could adversely affect any species that are not practical to survey for and known sites that were not located during subsequent surveys. These species would mainly include SS

hypogeous fungi species. However, the majority of these species have no known sites within the MPRA or the Northern Oregon Coast Range Mountains.

Invasive (Noxious Weeds, Invasive Non-native Species)

Exposed mineral soil often creates environments favorable for the establishment of non-native plant species. All road construction areas, road maintenance areas, ground-based logging areas and cable yarding corridors pose the greatest risk of exposing mineral soil with the implementation of these projects (mid and late-seral enhancements only; there are no noxious weeds or threats of exposed mineral soil that occur in the immediate area of the deciduous swamp site).

Any adverse effects from the establishment of Canadian and bull thistles, St. John's wort, tansy ragwort, Himalayan blackberry and Scot's broom within or near the project area are not anticipated and the risk rating for the long-term establishment of these species and consequences of adverse effects on the project areas is low because;

- the implementation of the Marys Peak integrated non-native plant management plan allows for early detection of non-native plant species which allows for rapid control,
- seeding the exposed soil areas would reduce the opportunity of spread.

Late-Seral Habitat and Deciduous Swamp Enhancements (Project 2)

Within the 32 acre late-seral stand, conifers that occur adjacent to existing wolf trees and extend outward to approximately 40 feet would be felled or girdled to increase CWD and snags to the stand. Approximately 20 wolf trees would be enhanced by reducing competition for light, water and nutrients with adjacent smaller trees.

Within and around the perimeter of the deciduous swamp, conifers would be felled or girdled to increase snags and CWD in the area and to remove trees otherwise considered as encroaching into the swamp. None of the trees cut or girdled would be removed from the project area. All of the material would remain on site to decay.

Trees felled would kill minor amounts of vegetation were the bole of the tree comes to rest on the ground. Other vegetation (including bryophytes) would be killed in locations were the branches and needles accumulate in dense piles and block any available sunlight to the plants. Most all epiphytic lichens and bryophytes that occur on the felled trees would die and be replaced with other lichen and bryophyte species. Minor infestations of the Douglas-fir bark beetle are anticipated. However, if a few additional conifer trees are killed due to higher than anticipated levels of Douglas-fir bark beetle infestations, it would add to the structural diversity of this project.

The project would reduce the canopy in a few small areas which would create an increase in available light to vegetation surrounding the reserved trees. This would allow for an increase in size and diversity of native perennial vegetation.

Special Status Botanical and Fungal Species

This project would not directly affect any SS vascular plant, lichen, bryophyte or fungi species since there are no known sites within or adjacent to the project area.

This project could affect any species that are not practical to survey for and any species that were not located during field surveys.

This project could create suitable habitat for several SS lichen or bryophyte species by allowing additional light to the reserved conifers.

Invasive (Noxious Weeds, Invasive Non-native Species)

Little mineral soil is expected to be exposed during the implementation of this project. The felling of trees would only have minor amounts of mineral soil exposed and it is expected that few if any noxious weed would become established through the implementation of this project. Therefore, the risk rating for the establishment of noxious weeds and any adverse affects is considered as low.

3.2.1.3 Cumulative Effects

Project 1 consists of commercially thinning 161 acres located on the western slopes of the Oregon Coast Range Mountains and within the Salmon-Neskowin Watershed Analysis area. The Salmon River-Siletz River Watershed encompasses approximately 64,000 acres. Approximately 4.7 percent of the Salmon River-Siletz River Watershed is under the jurisdiction of the Bureau of Land Management and this project occurs on less than 5.3 percent of the BLM-managed land. This proposed project occurs on 0.25 percent of the Salmon River-Siletz River Watershed. Effects of the proposed action on native vegetation are expected to be localized within the project area. Project 2 cumulative effects on native vegetation are expected to be minimal and localized within the project area.

3.2.2 Wildlife

(IDT Reports incorporated by reference: Biological Evaluation pp. 1-10 w/App A and B)

Affected Environment

Mid-Seral Habitat Enhancement (Project 1) and Late-Seral Habitat and Deciduous Swamp Enhancements (Project 2)

Landscape and Stand Level Conditions

The ownership pattern at the subwatershed scale (Slick Rock Creek; 9,257 acres) is a patchwork of BLM-managed land (including approximately 700 acres of USDA Forest Service) and private forest lands, with the majority of the land being in private ownership (67 percent). Wildlife habitat on private lands can be characterized as a matrix of managed conifer forest stands from 1 to 50 years old. These private forests provide a continuous source of early and mid-seral habitat that is relatively simple in composition and structure when compared to young unmanaged stands.

Habitat conditions on BLM-managed lands in the subwatershed are dominated by managed early-seral (0 to 39 years) and fire regenerated late-seral (80 to 199 years) stands. There are approximately 140 acres of old-growth stands (200+ years) on BLM-managed land in the watershed.

Managed early and mid-seral forests in the central Oregon Coast Range are currently dominated by Douglas-fir with some scattered and clumped western hemlock and various hardwoods. These second and third-growth forests typically have stands characterized by a single-layered, dense, overstory canopy with little to no large wood (greater than 24 inches DBHOB), live or dead, remaining from the previous stand. Under the current management plan the desired future condition for the BLM-managed forests in this subwatershed is late-seral/old-growth (LSOG) habitat. The development of any significant (greater than 500 acres) interior (greater than 500

feet from high-contrast edge) LSOG habitat may not be attainable in the Slick Rock Creek Subwatershed due to the size, shape, and location of the BLM and USDA Forest Service managed stands. The largest block of BLM-managed land in the subwatershed is separated by only 500 feet, from a large block of contiguous USDA Forest Service late-seral reserve habitat in the Lower Siletz River Watershed. The BLM-USDA Forest Service blocks do connect and the BLM block is considered part of this larger block of USDA Forest Service Core habitat (LSRA).

Special Habitats and Special Habitat Components

Special habitats in the conifer forests of the Oregon Coast Range are usually associated with the following environments; permanent shrub patches, oak woodlands, cliffs, caves, talus, wet/dry meadows, ponds/lakes, and other lentic wetland types. The only known special habitat in the project areas is a small (4 acres) deciduous swamp (Project 2) north of Project 1. The swamp area is heavily used by big game (numerous visual sightings and high trail density present) and is important to several bird species.

Special habitat components most important to wildlife in conifer forests of the Oregon Coast Range are very large diameter remnant/legacy live and dead trees. In addition to remnant structure, the following types of trees also function as special habitat components: stand-age trees which were open-grown (wolf trees); older cohorts with full live crowns; trees with deformities like broken tops, and large diameter deciduous trees (ie. bigleaf maple). All of these tree types provide a more complex stand structure, meet more wildlife needs than most trees in the stand, and make for a healthier functioning forest ecosystem. Larger diameter hard snags and CWD would, over time, provide for more wildlife species than smaller and softer snags and CWD. Although legacy structure, (either live or dead), has not been seen in any of the mid-seral stands of Project 1, the stands do have a significant number of wolf trees, or trees from an older cohort. Project 1 stands are lacking in desirable amounts of large, hard snags and CWD. The late-seral stand of Project 2 is similar to the mid-seral stands of Project 1 in that it too has no legacy wood, is lacking in large, hard snags and CWD, but also has a significant amount of wolf trees.

Special Status Species

Northern Spotted Owl

There are no known northern spotted owl nests/sites in or adjacent to the Bottleneck LSR Enhancement proposed action. The project area is within Oregon Managed Owl Conservation Area-42 (OMOCA-42) which is designated northern spotted owl critical habitat. The mid-seral stands of Project 1 function as northern spotted owl dispersal habitat and may also function as foraging and roosting habitat.

The late-seral stands in Project 2 are classified as suitable habitat (80+ years) and provide dispersal, roosting, and foraging opportunities but very little, if any, nesting habitat. The complex structure necessary for suitable nesting habitat is still underdeveloped in these relatively young (103 years) stands (which also lack a legacy component). The project area has never been surveyed for northern spotted owl presence (surveys not required). The closest known active northern spotted owl site is over four miles west of the proposed action on USDA Forest Service managed land.

Marbled Murrelet

There are no known marbled murrelet nests/sites in or adjacent to the Bottleneck LSR Enhancement proposed project areas. The project areas are within designated marbled murrelet critical habitat (Late-Successional Reserve RO-269). The mid and late-seral stands in Projects 1 and 2 currently do not provide suitable nesting structure for the marbled murrelet. Although the trees in the late-seral stands of Project 2 could be classified as suitable habitat because of their age (103 years old), they appear structurally younger due to the harsher growing conditions in the project area (shallow, rocky, ridge-top soil conditions and higher elevations). The project area has never been surveyed for marbled murrelet presence (surveys not required).

Mollusks

There are no known mollusk sites in or adjacent to the Bottleneck LSR Enhancement project areas. The project areas fall within the designated range of six SS mollusk species. Five of the mollusks have not been found in the MPRA since surveys began in 1997; the probability of finding any one of them in the project area is very low. The sixth, the warty jumping-slug, has so many known sites in the Oregon Coast Range that it was taken off the Survey and Manage list several years ago. Spring surveys were conducted in May of 2008 with no detections.

Red Tree Vole

There are no known red tree vole nests/sites in or adjacent to the Bottleneck LSR Enhancement project areas. Stands in Project 1 are not yet suitable habitat for the red tree vole. The largest trees in Project 2 may be suitable red tree vole nest trees. A purposive red tree vole survey was done in late-seral/old-growth stands throughout the Marys Peak RA in 2007. The best vole habitat on BLM-managed lands in the Slick Rock Creek Subwatershed was surveyed and no active nests were found. An intensive red tree vole survey within 100 meters of each tree selected to be released in Project 2 would be conducted before cutting and girdling begins.

Riparian Reserve Species

Approximately 17 acres of RR would be thinned in Project 1. One of the many functions of the RR LUA is to provide habitat for riparian-dependent and associated species, and specifically for the following native wildlife species; all mollusks, all amphibians, all bats, marbled murrelet, northern spotted owl (dispersal habitat function), red tree vole, and the American marten. Current conditions for the northern spotted owl, marbled murrelet, and red tree vole have been described above. Several mollusk, amphibian, and bat species are expected to occur within the RR LUA of the proposed project area. The American marten is rare in the northern Oregon Coast Range and is not expected to occur in the project area.

Bat Roost Species

The Northwest Forest Plan designated the protection of the following special bat roost habitats or habitat components within the North Oregon Coast Range Adaptive Management Area; caves, mines, abandoned wooden bridges, and abandoned buildings. These special bat roost habitat components are not present within the project area. Townsend's big-eared bat is also not expected to occur in the project area due to the lack of any caves or cave-like structures which are necessary for their roost sites.

Bird Species of Conservation Concern

Bird Species of Conservation Concern are migratory birds (Migratory Bird Treaty Act of 1918, MBTA) which have been exhibiting downward population trends for several years. There are approximately 87 bird species that can occur in the MPRA; 34 have a high likelihood of breeding

in the mid-seral stands of Project 1, 14 have a moderate likelihood, 29 have a low likelihood, and 10 are not expected to breed within the project area. There are 34 bird Species of Conservation Concern that can occur in the MPRA; 15 have a high likelihood of breeding in the Project 1 treatment area, 6 have a moderate likelihood, 10 have a low likelihood, and 3 are not expected to breed in the project area. See Appendix B for all birds and Species of Conservation Concern that occur in the MPRA.

Environmental Effects

3.2.2.1 Alternative 1 (No Action Alternative)

Mid-Seral Habitat Enhancement (Project 1)

The mid-seral stands of Project 1 would continue to grow and develop into mature structure at a much slower rate than if released through thinning; the wolf trees would lose their full crowns as the largest lower branches die off. There would be no immediate impulse of new, large, hard snags and CWD created in the Project 1 stands.

Late-Seral Habitat and Deciduous Swamp Enhancements (Project 2)

The large, dominant wolf trees in the late-seral stand of Project 2 would lose their largest lower limbs to competition and no immediate impulse of new, large, hard snags or CWD would be created. Species dependent on larger and more complex structure, both live and dead, would avoid these stands for a longer period of time. The deciduous swamp would grow smaller over time due to the continued invasion of conifer trees from the surrounding stand and no immediate impulse of new, large, hard snags or CWD would be created around its perimeter.

Alternative 2 (Proposed Action)

3.2.2.2 Alternative 2 (Proposed Action)

Mid-Seral Habitat Enhancement (Project 1) and Late-Seral Habitat and Deciduous Swamp Enhancement (Project 2)

Landscape and Stand Level Effects

The wildlife enhancement treatments are expected to maintain (short-term neutral impacts) the functionality of the mid, late-seral, and deciduous swamp habitats at the subwatershed landscape level. These actions would have long-term positive impacts for species dependent on LSOG forest habitat in the subwatershed by accelerating the development of large tree structure, by creating snags and CWD, and by protecting the full live crowns of wolf trees.

The thinning prescription for Project 1 would remove the suppressed, intermediate, and smaller co-dominant Douglas-fir, and leave most dominant Douglas-fir and all the western hemlock, Sitka spruce, noble fir, cedar, and large hardwood. Although the stand's overstory tree diversity would remain the same, its composition would better reflect late-seral conditions, with a decrease of Douglas-fir and increased proportions of western hemlock, Sitka spruce, noble fir and western red cedar. Since the largest trees with the best crown ratios would be left, the post-treatment crown canopy is expected to be 40 percent or greater over the project area. The most significant short-term impacts (lasting about ten years) would be a simplification of the stand's live structure, (due to the removal of green trees), along with an increase in structural complexity

and species diversity in the understory structure, (due to an increase in light penetration and available water in the soil).

The Project 2 late-seral stand would continue to function as late-seral habitat due to the light touch of the proposed treatment. The stand's composition would remain unchanged. There would be an immediate positive impact to the mid and late-seral stands, and to the deciduous swamp when new, hard snags and CWD are added to the habitats.

Special Habitats and Habitat Components

The felling of some encroaching trees from around the small deciduous swamp would help to maintain its function as a patch of unique lentic habitat in the watershed. In addition, the cut or girdled trees would provide some valuable large dead wood in and adjacent to the swamp. The treatment would provide both short and long-term benefits to a variety of wildlife species.

The mid and late-seral stands of Project 1 and 2 are lacking in volume of large, hard, dead wood when compared to other unmanaged stands their age. While both stands have well developed wolf trees, the lowest and largest live branches are being crowded out by adjacent tree competition. The proposed action would have a positive impact on live and dead structure; first by protecting the existing live structure of the wolf trees, and next by creating new snags and CWD in the process of releasing the wolf trees. Creation of additional dead wood in Project 1 would be deferred while the stand is monitored for at least five years since some blowdown is expected after the thinning operation. These actions are expected to have no known negative impacts to stand composition or function, while both immediate and long-term positive impacts are anticipated for species which require complex large structure associated with the late-seral forest environment.

Special Status Species

Refer to Appendix A of the Wildlife Biological Evaluation for a summary of the impacts of this action on all Special Status terrestrial wildlife species in the MPRA.

Northern Spotted Owl

The two projects would modify the structure and composition of northern spotted owl designated critical habitat (OMOCA-42) at the stand level but would maintain the functionality of current primary constituent elements, thereby preserving the conservation value of the habitat. Project 1 would modify the structure and composition of northern spotted owl dispersal habitat at the stand level but would maintain the functionality of the habitat for northern spotted owl dispersal habitat. Project 2 would modify the structure and composition of northern spotted owl suitable habitat at the stand level but would maintain the functionality of the habitat for northern spotted owl foraging, roosting, and dispersal activities. The long-term impact of density management and wolf tree release on northern spotted owls would be positive since the existing habitat would develop into suitable nesting habitat sooner than if left untreated. Project 2 would also have immediate and long-term positive impacts for northern spotted owls by improving prey habitat by the creation of large dead wood in the stands.

The proposed action is considered to be may affect, not likely to adversely affect northern spotted owls designated critical habitat (OMOCA-42) at the stand and patch levels from Projects 1 and 2; may affect, not likely to adversely affect spotted owls at the stand level from Project 1; and may affect, not likely to adversely affect northern spotted owls at the patch level from Project 2.

Marbled Murrelet

The projects would modify the structure and composition of marbled murrelet designated critical habitat at the stand level but would not preclude or delay the attainment of suitable nesting habitat, thereby preserving the conservation value of the habitat. Treatment of the mid-seral habitat in Project 1 would have long-term positive effects by accelerating the time it would take for these stands to develop into suitable nesting habitat. Treatment of the late-seral habitat in Project 2 would have long-term positive effects by preserving the full crowns of the largest wolf trees in the stand.

The proposed action is considered to be may affect, not likely to adversely affect marbled murrelet designated critical habitat (OMOCA-42) at the stand and patch levels, no effect to marbled murrelet at the stand level from Project 1 for the thinning of non-suitable habitat; and no effect to marbled murrelet from Project 2 for the release of wolf trees (potential future marbled murrelet nest trees) in designated suitable habitat at the patch level.

To address concerns for potential effects to critical habitat for spotted owls, the proposed action will be consulted upon with the U.S. Fish and Wildlife Service, as required under Section 7 of the ESA. Consultation for this proposed action will be accomplished by its inclusion within a programmatic Biological Assessment (BA) that analyzes all projects that may modify the habitat of listed wildlife species on federal lands within the Northern Oregon Coast Range during fiscal years 2009 and 2010. This proposed action has been designed to incorporate all appropriate design standards likely to be included in the pending BA. Upon completion of consultation, if any additional design standards are set forth in a Biological Opinion or Letter of Concurrence, then these standards would be incorporated into the design of this project prior to issuance of a decision record for these projects.

Mollusks

If any SS mollusk species are found during the fall 2008 surveys their sites would be managed to mitigate action impacts. The action would have a long-term positive impact on these mollusks, if, in fact, they prefer LSOG habitat, since the proposed treatments would accelerate the development of LSOG conditions within the selected stands. No significant negative impacts at the stand and patch levels from Projects 1 and 2 to several mollusk species would occur.

Red Tree Vole

The projects would have a positive impact on red tree voles since the vole prefers late-seral habitat and the proposed treatments would accelerate the development of these conditions within the selected stands. If any active tree vole nests are found, then Project 2 treatments would be moved to a new wolf tree location within the stand, or the number of treated wolf trees would be reduced. No significant negative impacts at the stand and patch levels from Projects 1 and 2 to red tree vole would occur.

Riparian Reserve Species

The thinning and wolf tree treatments proposed for the mid-seral habitat in Project 1 would have long-term positive impacts on those mollusks, amphibians, and bats which may occur within the RR LUA, and which prefer LSOG habitat conditions, because LSOG characteristics will be attained at an accelerated rate. The short-term negative impacts would be insignificant due to the small treatment area and light to moderate thinning prescription.

Bird Species of Conservation Concern

Refer to Appendix B of the wildlife *Biological Evaluation* for information on all birds in the MPRA.

In the central Oregon Coast Range the majority of birds complete their breeding cycle within the April 15 to July 15 time period while some birds (eagles; owls; hawks; woodpeckers) begin breeding as early as February or March and others (flycatchers; finches) do not finish breeding until August. Due to the ubiquitous nature of breeding birds, soil disturbance (affecting ground-nesting birds) and vegetation manipulation would have a direct negative impact on bird nesting success if it occurs during the breeding season. There is a high likelihood that some level of disturbance to nesting birds would occur if Project 1 thinning operations are conducted during the February-August breeding season. Project 2 impacts would not disturb nesting birds since the treatments would occur after August and before February.

The Bottleneck Project 1 thinning treatment is not expected to modify bird nesting and foraging habitats to the point that some species are no longer able to occupy the site. Research shows that bird species respond differently to changes in their nesting and/or foraging habitats; some populations seem to be unaffected by thinning (for example, Stellar's Jay, Black-headed Grosbeak), some decrease in numbers (for example, Golden-crowned Kinglet, Hermit Warbler, Pacific-slope Flycatcher, Varied Thrush), and others increase (for example, American Robin, Hairy Woodpecker, Dark-eyed Junco, Western Tanager). Responses to thinning can occur immediately and then change slowly over time. In some cases short-term (0-5 years) decreases can lead to mid-term (6-10 years) and/or long-term (10+ years) increases (for example, Hermit Warbler, Varied Thrush); in other cases just the opposite response can occur (for example Olive-sided Flycatcher, Evening Grosbeak, Townsend's Solitaire). In general, species that nest and/or forage in closed canopies would show declines commensurate with the intensity of the thinning, and species that nest and/or forage in open forest canopies usually increase in numbers. Species that nest and forage on the ground and in the understory usually maintain their pretreatment abundance or show an increase in abundance after the thinning. Projects 1 and 2 include the creation of snags and coarse woody debris which would improve habitat conditions in the stands for those species which nest or roost in, and/or forage on, dead wood (for example, Hairy Woodpecker, Northern Flicker, Pileated Woodpecker, Red-breasted Sapsucker, Winter Wren).

3.2.2.3 *Cumulative Effects*

There would be a positive cumulative impact in the Slick Rock Creek Subwatershed to wildlife habitat from this action since the projects are designed to enhance the conditions of the existing habitat by increasing structural diversity (both live and dead), accelerating the development of late-seral habitat, and maintaining deciduous swamp habitat. The subwatershed is dominated by private lands which would only provide simple-structured early and mid-seral forest habitat under current management plans. If these private lands cannot provide late-seral forest habitat conditions, then any treatments which enhance diversity and the development of late-seral characteristics would have a positive effect on species, systems, and functions in the watershed.

3.2.3 Soils

(IDT Reports incorporated by reference: Soils Environmental Assessment for the Proposed Bottleneck Projects Report pp.1-15)

Affected Environment

Mid-Seral Habitat Enhancement (Project 1) and Late-Seral Habitat and Deciduous Swamp Enhancements (Project 2)

The slopes in Sections 8 and 9 vary from 0 to 85 percent. The maximum slope in the harvest areas is approximately 60 percent. There is the potential for moderate to severe landslides on all slopes greater than 60 percent. No landslide scars have previously been identified in the project area. (Boateng, 1999).

Less than one percent of the proposed project area is occupied by distinguishable skid trails. There is some evidence of recent recreational vehicle use in the project area on the upper portion of Unit 8A. There are very thin surface soils in this area and the high percentage of rock near the surface has kept disturbance to the lower soil mantle to a minimum.

The existing road surfaces within the proposed project area have low slopes and are stable. Salmon-Neskowin Watershed Assessment found a low to moderate risk of landslide failure in the project area and proposed timber haul routes.

There are two primary management concerns with the soils found in the project area: 1) the potential for surface soil displacement, surface erosion and dry ravel and 2) the potential for soil compaction. Soil displacement and erosion are of greatest concern in the skyline portion of Unit 8A where the soil layer is shallow, slopes are steep, and there is a high content of coarse fragments in the soil. With increasing slope, the surface soil is subject to dry raveling if the vegetation and litter layer is removed. Under wetting/drying or freezing/thawing conditions, the surface soil particles can detach and will migrate down slope if the vegetation, litter and debris layer is absent. This effect is most prevalent for the steeper sloped areas which occupy approximately 24 acres of Unit 8A.

Environmental Effects

3.2.3.1 *Alternative 1 (No Action)*

Mid-Seral Habitat Enhancement (Project 1) and Late-Seral Habitat and Deciduous Swamp Enhancements (Project 2)

Potential impacts to soils from the proposed actions would not occur. Soils conditions and trends would continue as described under the Affected Environment section above.

3.2.3.2 *Alternative 2 (Proposed Action)*

Mid-Seral Habitat Enhancement (Project 1)

Compaction and disturbance/displacement of soil

Ground-based yarding:

For those portions of Units 8A and 9A using ground-based yarding systems, impacts would vary depending on whether a harvester/forwarder system or crawler tractors are used, how dry the soils would be when heavy equipment operates on them, and how deeply covered with slash the soils in the skid trails would be. In tractor skid trails, a moderate amount of top soil displacement and moderate to heavy soil compaction could occur depending on the amount of use. In harvester/forwarder skid trails, soil displacement would be minimal and soil compaction would be light to moderate.

For crawler tractor (and shovel) systems, soil impacts would be expected to result in moderate to heavy, fairly continuous compaction within the landing areas and the main skid trails which are approximately 10 feet in width. Impacts would be light to moderate and less continuous on less traveled portions of tractor skid trails and for all shovel system trails. If skidding is done using crawler tractors for all the proposed ground-based units (90 acres), the percentage of total tractor unit area impacted by surface disturbance and soil compaction as a result of skid trails would be approximately two percent or a total of 1.5 acres (as a percentage of the total project area approximately 0.8 percent). Worst case expected reduction in productivity for the skid trails would be a 30 percent reduction in yield on those acres (1.5 ac.).

If harvester/forwarder systems are used, skid trails are expected to result in light to moderate compaction in two discontinuous, narrow strips less than 3 feet in width. If a harvester/forwarder system is used for the entire proposed ground-based area (90 acres), the percentage of total ground-based unit area impacted by surface disturbance and soil compaction as a result of skid trails would be approximately one percent or a total of 0.75 acres (as a percentage of the total project area approximately 0.4 percent). Very little top soil loss or soil displacement should occur. The effect on overall site productivity from light to moderate compaction on less than one percent of the total proposed project area would be expected to be low (no measurable reduction in overall yield for the project area).

Some of the potentially impacted acreage listed above, includes already existing skid trails and where practical, portions of these existing trails would be used for this project. As a result, the amount (acreage) of new or additional harvest impacts would be less than the totals listed above. For the project, the total (new and existing) area of impacted ground is not projected to exceed the 10 percent district guideline for aerial extent of soil impacts listed in the Salem District ROD.

Skyline yarding:

Tree harvest and yarding could increase surface soil displacement, surface erosion and dry ravel and soil compaction. The aerial extent and degree of additional compaction expected to result from this project, would remain within accepted district guidelines (10 percent or less). The steepest areas in the project area, with the most fragile soil types, would be skyline yarded.

Skyline yarding corridors would affect about one percent of the skyline units or a total of 0.75 acres, (as a percentage of the total project area approximately 0.4 percent). Impacts from skyline yarding usually result in light compaction of a narrow strip less than 4 feet in width. Skyline

yarding would occur on areas with deeper soils, where there is less risk of soil erosion or dry ravel. The effect on overall site productivity from light compaction on approximately 0.4 percent of the total project area would be expected to be low (no measurable reduction in overall yield for the project area).

Landings:

Potential impacts to soil resources include the additional area used for landings. For all landings on BLM-managed lands, a portion of the existing timber haul road or a proposed skid trail would be used for equipment to operate on. Some additional ground adjacent to the road surface would be used to turn equipment around on and to sort and deck logs until transport. The degree of soil disturbance and compaction in areas where logs are sorted or decked would be expected to be low. Areas where equipment turns or backs around on, multiple times would experience heavy compaction and disturbance to the top soil layer.

Approximately 48 small landings would be needed to harvest the proposed units. Twelve landings would be used for skyline yarding, (18 would be used for both skyline and ground-based yarding). Eighteen landings would be used solely for ground-based yarding. Almost all of the landings would use existing road surfaces or clearings. Landings constructed on roads would use the road surface for approximately half of the landing. The additional area adjacent to the road that would be needed for a landing is estimated to be approximately 600 square feet per landing. For the entire proposed project area this amounts to a total of 0.6 acres for all landings on BLM-managed lands (as a percentage of the total project area, less than 0.4 percent).

Road Work (road construction, renovation, skid trail construction and blocking):

Constructing approximately 5000 feet of new road (and ditch lines) would result in loss of topsoil and compaction of sub-soil on approximately 1.8 acres. The area is currently forested land that would be converted to non-forested. The roads to be constructed would be on moderate topography (grades of approximately 5 percent to 10 percent), so the total width of the clearing would be expected to be around 14 feet. This narrow clearing would have a minimal effect on overall tree spacing and stocking. All of the new construction would be decommissioned following harvest, so some recovery back to a forested condition would occur in this area over time.

Log hauling would not be limited to dry season. The main haul route will be the Lindsey Ridge Road which is a surfaced road with no perennial stream crossings on BLM lands. The lower portion of the Lindsey Ridge Road is paved except for approximately 1.2 miles in T6S R10W, sections 3 and 10. This portion of the road is graveled but has one area that is within 500 feet of the stream that delivers road runoff and sediment to the hillslopes above Bear Creek. This area has a steep drainage from the road culvert and attached ditch line that shows recent scour and deposition of sediment directly to a terrace 15 feet above the flood plain. There is no direct connection of this runoff to Bear Creek. This section of road is under county maintenance. The design features include upgrading the sediment storage capacity of the road ditch lines during the haul period using bark bags and the maintenance of sediment basins at the outlets of culverts. The major problem road segments on the Slick Rock Creek Road; 7-9-9.3 and the last mile of road 7-9-5 in sections 5 and 8 would not be used for log haul with this proposal and were not studied further.

Site Productivity

The estimated reduction in growth rate for trees on moderately impacted areas (skid trails and landing) is approximately 15 percent during the first 10 to 20 years of growth. As trees age and become established, the negative effect on growth from soil compaction and displacement becomes less pronounced and growth rates may approach that of trees on similar, undisturbed sites. This is especially true where the area of compaction/displacement tends to be in narrow strips, as is the case with skid trails and small landings. If top soil loss/displacement/compaction is severe or more broadly based in aerial extent, then the negative effects would be more pronounced and longer lasting.

For the those portions of Units 8A and 9A where ground-base skidding would be used, the effect on project site productivity from the most impacted 1.5 acres (including skid trails and landings) would be a 1.7 percent reduction in overall yield for the ground-based units; this assumes tractor yarding exclusively, as impacts from using a harvester/forwarder or shovel system would be less severe. The effect on project site productivity resulting from skyline yarding landings and corridors, 1.5 acres, would be expected to be a 2.0 percent reduction in overall yield for the proposed skyline yarding unit areas. The effect on overall project site productivity (from all proposed units) would be a 1.3 percent reduction in overall yield for the entire 153 acre treatment area.

No measurable amounts of surface erosion would be expected from the forested lands treated under this proposed alternative. With timber hauling restricted to periods when no water is flowing on road surfaces, the amount of sediment produced from roads and entering streams would be small.

Hand piling and burning slash and small conifers could produce small patches of soil with altered surface properties that restrict infiltration. However, erodibility rates would be expected to return to original levels a year or two after the burn, as soil and vegetation recover. A slight mineralization of nitrogen under the piles burned could occur, which would enhance plant growth at the spot. However, pile burning is not expected to result in overall long-term losses to soil structure or productivity.

Late-Seral Habitat and Deciduous Swamp Enhancements (Project 2)

Girdling trees for snag creation would not measurably impact soil resources. Felling trees for CWD would cause minor soil displacement and compaction where the tree falls on the ground. Coarse woody debris would be cut and left in place (no further soil displacement) and the impacts would be of no greater extent than a natural tree fall.

3.2.3.3 Cumulative Effects

Because the effects of the proposed action on soils are expected to be short-term and localized, cumulative effects are not anticipated. The cumulative effect of the proposed density management treatments would increase the overall amount of compaction and erosion in the project area but would fall well below the soil disturbance standard in the Salem District ROD. There would be no cumulative effects from the deciduous swamp enhancement on the soils resource because the activity includes only the felling of trees into the area which would mimic natural windthrow. There are no other known actions which would be enhanced or diminished by these proposed actions.

3.2.4 Water

(IDT Reports incorporated by reference: Hydrology/Channels/Water Quality Addendum for Bottleneck Project pp.1-16)

Affected Environment

Mid-Seral Habitat Enhancement (Project 1) and Late-Seral Habitat and Deciduous Swamp Enhancements (Project 2)

The project areas contain headwater tributaries of Slick Rock Creek which drains into the Salmon River. The project lies within one six-field watershed: Slick Rock Creek, within the Salmon River-Siletz River Watershed. Salmon River and Slick Rock Creek is neither key watershed nor identified as a municipal watersheds. Trout Creek also drains one portion of the project area but since it is a tributary to Slick Rock Creek it is included by reference to Slick Rock Creek.

The project area receives approximately 120 inches of rain annually and has a mean 2-year precipitation event of approximately 7.5 inches in a 24-hour period (Miller 1973). Most surface runoff is associated with winter storm events that result from low pressure fronts moving inland from the southwest off the Pacific Ocean. Peak stream flow events are concentrated in the months of November through March when Pacific Storm fronts are strongest. As a result of transient snow pack accumulation and infrequent rainfall in the summer, stream flow is typically a fraction of winter levels and many headwater channels retreat to subsurface flow. At a distance of approximately 10 miles from the Pacific Ocean, the Salmon River valley experiences a high to moderate contribution to watershed hydrology from fog and fog drip in the project area (USDA-NRCS).

Terrain in the project area watersheds is generally hilly with elevations ranging from approximately 1600 to 2600 feet. While snow pack accumulation in the Oregon Coast Range is unusual, the project area lies within the transient snow zone (TSZ). In most years, at elevations above 2000 feet, snow can remain for short periods and may be subject to rain on snow events (ROS) (U.S.D.I. 1995). Overlapping areas between high intensity rainfall and high ROS events are particularly vulnerable to extreme storm events and may lead to flooding (USDI 1996). The proposed project area lies within the TSZ but due to the proposed harvest type (thinning) both Slick Rock Creek and the Salmon River would continue to be at a low risk for peak flow events resulting from rainfall rapidly melting snow pack (see peak flow analysis in project file).

Project area streams

Stream channels in the project areas are primarily small, intermittent 1st order headwater streams; following the classification of Montgomery and Buffington (1993). These streams are generally narrow, steep (gradient eight percent or greater), with low curving and moderate to high entrenchment (Rosgen 1994). Due to shallow soil conditions, most flow travels as near-surface runoff, which may or may not combine into surface flow down slope.

Stream flow data is not available for project area streams.

Project area water quality and beneficial uses

Fine sediment and turbidity

During field review of stream channels in the project area, channels were observed to be mostly stable and functional with sediment supplies in the range expected for these stream types. Sedimentation delivery from roads in the project area is limited with few road stream crossings. No quantitative turbidity data was located for this analysis.

Stream Temperature

No stream temperature data exists for project area streams due to their intermittent nature. All tributary reaches in the project area would be given a 55-foot primary shade zone distance based on the hill slope of the area, following the Northwest Forest Plan Temperature Total Maximum Daily Load (TMDL) Implementation Strategy (2005).

Other Water Quality Parameters

Additional water quality parameters (e.g. nutrients, dissolved oxygen, pesticide and herbicide residues, etc.) are unlikely to be affected by this proposal and were not reviewed for this analysis (U.S.E.P.A. 1991).

Oregon Department of Environmental Quality (DEQ) Standards

The Oregon Department of Environmental Quality's (DEQ) 2004-2006 303d List of Water Quality Limited Streams (<http://www.deq.state.or.us/wq/assessment/rpt0406/results.asp>) is a compilation of streams which do not meet the state's water quality standards. A review of the listed streams for the Siletz-Yaquina 4th field HUC was completed for this report. The Salmon River is listed for numerous parameters ranging from nutrients to metals. Slick Rock Creek was delisted in 2002 and is no longer on the official 303(d) list for Oregon.

The DEQ also published an assessment, the 319 Report, which identifies streams with potential non-point source water pollution problems (1988 Oregon Statewide Assessment of Nonpoint Sources of Water Pollution). Salmon River and Slick Rock Creek are not included on this list.

Beneficial Uses

There are no known domestic or municipal water rights in the project area. The closest proximity water rights to the project include: domestic irrigation (lawn and garden), approximately five miles downstream of the BLM-managed lands in Section 8 (WRIS 2004).

Additional recognized beneficial uses of the stream-flow in the project area include anadromous fish, resident fish, recreation, and esthetic value. Best management practices, as described below under environmental effects would be implemented to help eliminate and/or minimize any potential impacts to beneficial uses of the project watersheds.

Environmental Effects

3.2.4.1 *Alternative 1 (No Action)*

Mid-Seral Habitat Enhancement (Project 1) and Late-Seral Habitat and Deciduous Swamp Enhancement (Project 2)

The no action alternative would result in a continuation of the condition and trends as described in the Salmon-Neskowin Watershed Analysis (BLM/USDA Forest Service) and the Affected Environment section of this report. There would be no improvements to the Lindsey Ridge and lower Bear Creek roads.

3.2.4.2 *Alternative 2 (Proposed Action)*

Mid-Seral Habitat Enhancement (Project 1)

Stream Flows

Measurable effects to hydrologic processes, channel conditions, and water quality due to the proposed action are unlikely. Alterations in the capture, infiltration and routing (both surface and subsurface) of precipitation may occur as a consequence of the mechanical removal of trees and reductions in stand density. This effect from the proposed action would be difficult to measure and unlikely to substantially alter stream flow or water quality.

Numerous studies have documented increases in mean annual water yield and increases in summer base flow following the removal of watershed vegetation; vegetation intercepts and evapotranspires precipitation that might otherwise become runoff (Bosch et al. 1982). Thus, it can be assumed that this project would likely result in some small increase in water yield which correlates with the removal of conifers, the death of larger conifers by girdling, and a short-term reduction in vegetation cover through pile burning. However, other than increased peak flows, an increase in fall and winter discharge from forest activities is likely to have little biological or physical significance (U.S.E.P.A. 1991).

In almost all cases, removal of more than 20 percent of the vegetative cover over an entire watershed (5th-field) would result in increases in mean annual water yield. Removal of less than 20 percent of vegetative cover has resulted in negligible changes, where it was not possible to detect any effect (i.e. the error in measurements was greater than the change) (Bosch 1982). In addition, alterations in the timing and/or quantity of peak flow events as a result of forest harvest and road construction have been studied for several decades (Jones and Grant 1996). The proposed project sites would affect approximately 1.7 percent of the forest cover in the Slick Rock Creek Subwatershed and 0.3 percent in the larger Salmon River-Siletz River Watershed. Because of the small percentage of forest cover being affected by this project, increases to stream flow (mean annual yield and summer base flow) caused by this action alone are unlikely to be measurable. There is a low risk of increased peak flows due to ROS winter storms. This effect is presumed to be small because the vegetation treatment planned is only a thinning and should not alter the vegetation structure of the landscape such as clear cutting would.

Stream Temperatures

Increases in stream temperature as a result of this action are unlikely. All tributary reaches in the project area would have a 55-foot primary shade zone distance based on the hill slope of the area. Trees located within this primary shade zone would not be harvested thus helping to maintain the

existing thermal regime of the tributary by maintaining greater than 80 percent effective stream shade. At stream heads, where groundwater and surface water interfaces, stream temperatures are relatively insensitive to change and are likely consistently below ODEQ temperature standards.

Project Area Water Quality

Sediment Supply, Transport and Turbidity

It is unlikely that the proposed projects would lead to measurable increases in sediment delivery to streams, stream turbidity, the alteration of stream substrate composition, or sediment transport regime. Stream protection zones would eliminate disturbance of streamside vegetation; no trees would be cut from the stream bank or where roots are stabilizing the stream bank. Tree girdling and piling of slash would have minimal to no ground disturbance and no activities would take place directly in or adjacent to stream channels.

Skyline and ground-based skid trails, if sufficiently compacted, could route surface water and sediment into streams. However, several factors would limit the potential for this to occur. Even if compacted, high levels of residual slash left on yarding corridors (both machine and skyline), would reduce runoff by deflecting and redistributing overland flow laterally to areas where it would infiltrate into the soil. Existing skid trails would be used for ground-based equipment as much as possible to reduce additional soil compaction and the total surface area of landings would be kept to a minimum. In addition SPZs in riparian areas have high surface roughness, which function to trap any overland flow and sediment before reaching streams. Ground-based skidding would occur during periods of low soil moisture with little or no rainfall, in order to minimize soil compaction and erosion.

Burning hand piles could produce patches of soil with altered surface properties that restrict infiltration. However, these surfaces would be surrounded by larger areas that could absorb runoff or sediment that reach them. In addition, piles would be burned outside of SPZs and away from standing or running surface water.

Since the proposed action is unlikely to result in any measurable increase in stream temperature or sedimentation and would not place large amounts of fine organic material in the streams or alter stream reaeration, it is unlikely that it would have any measurable effect on dissolved oxygen or nutrient levels.

Road Construction and Maintenance:

The proposed action includes construction of 5000 feet of new spur roads and the renovation of eight miles of existing roads that would be used for timber haul. Road construction and renovation effects would be limited by restricting work to periods of low rainfall and runoff.

The new road construction would occur along contour, near the ridgetop. All road construction would be outside of the Riparian Reserve, except for a short section near Unit 8E (less than 300 feet). These new roads would minimize the interception/disruption of subsurface flow.

Construction would employ techniques to reduce the concentration of runoff and keep sedimentation to a minimum and since no additional stream crossings would be constructed, there would be little opportunity for sediment from these surfaces to directly enter streams. To minimize the potential for runoff accumulating on the road surface, following the proposed action, the new roads would be decommissioned.

During road renovation, impacts to water quality would be expected while drainage structures are being improved or replaced. Impacts would be greatest if equipment is operating in and/or adjacent to the stream channels.

Impacts of skid trail construction would be the same as those for yarding corridors described above. Following project completion; water-barring, grass-seeding and blocking the trails would help to minimize surface runoff on and erosion of these trails; this would thereby reduce any sedimentation potential from these roads.

Late-Seral Habitat and Deciduous Swamp Enhancement (Project 2)

There would be no significant impacts to water resources from girdling or overtopping trees to create snags or falling trees for CWD. Trees would be selected from outside SPZs and would not likely impact stream shade, bank stability, or channel structure.

3.2.4.3 Cumulative Effects

The proposed action, when combined with other proposed actions in the Slick Rock Creek Subwatershed, and the larger Salmon River-Siletz River Watershed is unlikely to have detrimental cumulative effects on the hydrologic regime. A level 1 analysis was performed to determine the risk of increasing peak flows in the Slick Rock Creek Subwatershed, and the larger Salmon River-Siletz River Watershed through density management.

The watersheds were initially analyzed for land ownership, vegetation type, age class, and extent of TSZ. Using these parameters and the methodology of the *Salem District Watershed Cumulative Effects Analysis Procedure 1994*, a risk factor (“rfactor”) was calculated to determine the relative risk or sensitivity of areas to increases in runoff and consequently peak stream flows. Currently, the average rfactor value in these watersheds is “1”, which is considered low (on a scale of 0-3, with 3 = high risk of increases to peak flows).

The assessment indicates a low risk of peak flow enhancement for watersheds that are in the ROS zone based on the proposed harvest treatment type (thinning). All of the project area activities are located in the ROS zone. Based on the assessment for this project, the risks of peak-flow enhancement in these watersheds are “low”.

Due to the small amount of federal land in these watersheds, cumulative impacts to the Slick Rock Creek Subwatershed and Salmon River-Siletz River Watershed are likely to continue to be dominated by actions on private lands. Current and likely future management actions on public lands in the watershed include: stand density management through timber sales, road maintenance (drainage improvements, renovations, decommissioning), and riparian treatments. Likely future private actions include: timber management and associated road construction in the highlands and continued settlement and agricultural development in the lowlands.

Because of the small amount of land affected by the proposed action and because the anticipated effects of the proposed action on hydrology would be short-term and localized, the proposed action is not likely to contribute to cumulative effects in the Slick Rock Creek Subwatershed or downstream in the larger Salmon River -Siletz River Watershed.

3.2.5 Fisheries/Aquatic Habitat

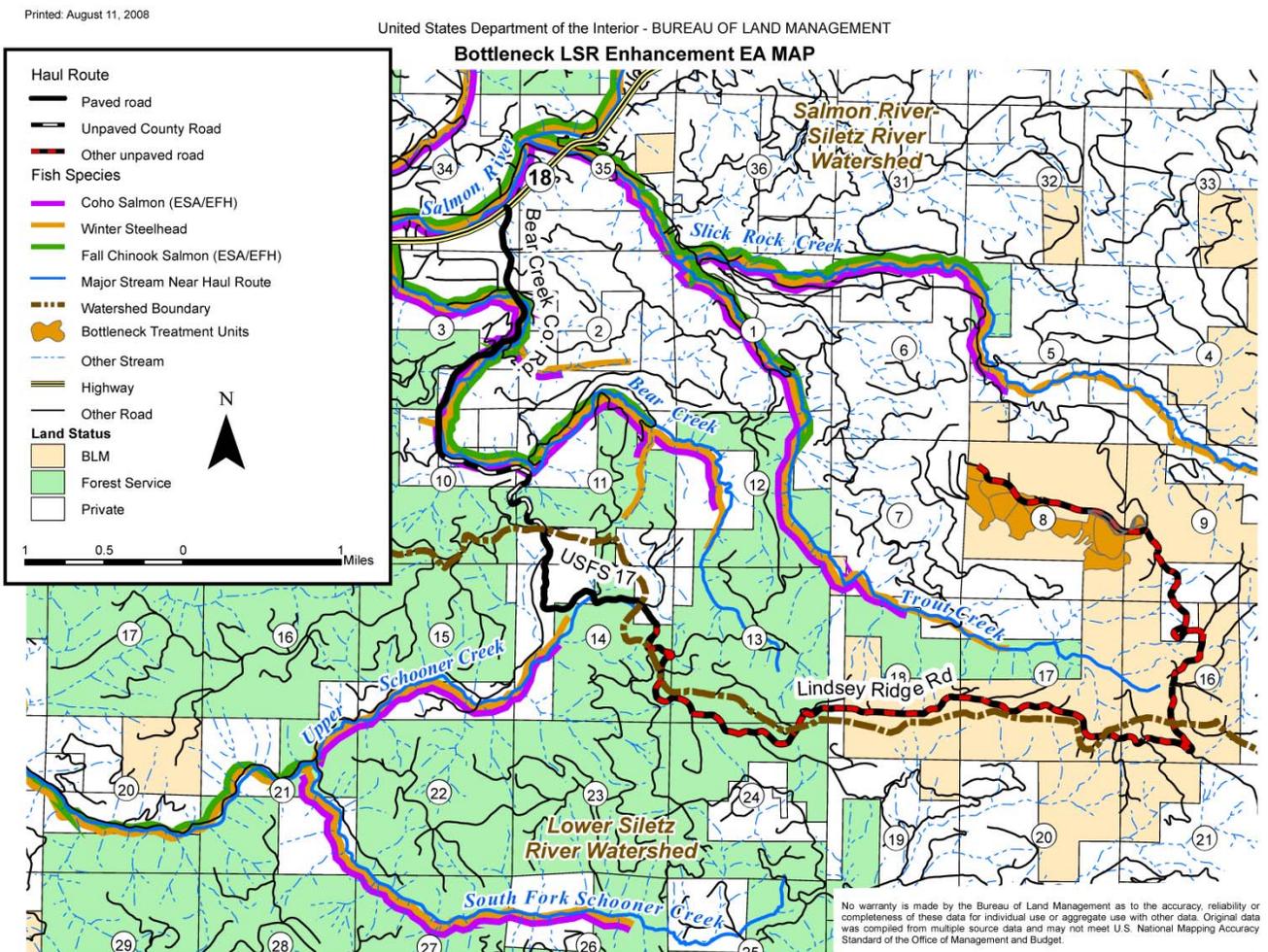
(IDT Reports incorporated by reference: Bottleneck Fisheries Report pp. 1-20)

Affected Environment

Mid-Seral Habitat Enhancement (Project 1) and Late-Seral Habitats and Deciduous Swamp Enhancements (Project 2)

The proposed action is contained within two 5th field watersheds; Salmon River-Siletz River Watershed and the Lower Siletz River Watershed. The relevant fish bearing streams affected by the action are Slick Rock Creek and Trout Creek draining to the Salmon River. Project 1 would treat 161 acres limited to two drainages; Trout Creek and Slick Rock Creek all within the Salmon River-Siletz River Watershed. The proposed timber haul route for Project 1 would cross both of the 5th field watersheds (see Map #3).

Map 3: Proposed Timber Haul Route and Anadromous Salmonid Fish Distribution of Bottleneck LSR Enhancement Project



Oregon Department of Fish and Wildlife (ODFW) habitat surveys have been conducted on Trout Creek approximately 2½ miles downstream from the project areas. Impaired habitat conditions were noted for pools, shade, fine sediment, key wood, and width to depth ratio in the ODFW

habitat surveys; conditions are based on ODFW Aquatic Inventory Habitat Benchmarks (Foster et al 2001). Gravel percentages were between desirable and undesirable benchmark conditions in the project affected reach. The low abundance of key wood is likely impairing the quality and abundance of pool habitat through-out the surveyed reaches. The undesirable amount of silt/sand documented in the surveys likely impairs functionality of the gravels as spawning/incubation habitat.

No fish species were documented in the treatment area of either Slick Rock Creek or Trout Creek (Calver and Snedaker 2006). The precise upper limit of fish distribution is unknown for most of the affected streams associated with the project area. Distribution of fish species can be estimated based on accessibility to suitable habitat determined by stream slopes, sufficient drainage area to create minimal suitable habitat, and known long standing barriers (Bjorn and Reiser 1991). The upper limit of fish species in proximity to the project area (not field identified) was derived using two methods.

1. Streamnet (2007) maps identify salmon and steelhead distribution near the project area and passage barriers in proximity to the project area which may limit fish migration.
2. Comparisons with fish presence-absence surveys conducted nearby indicate drainage areas of approximately 50 acres are necessary to provide suitable habitat for native trout and sculpin species. Current literature indicates salmon, steelhead, and cutthroat trout may use stream channels with contiguous slopes up to 20 percent (Bryant et al 2004). Local field experience corroborates the literature estimates. BLM Geographic Information System (GIS) Digital Elevation Models (DEM) of hillside contours was used to estimate stream slopes and drainage areas for streams near the project area (BLM 2008). The slope and drainage area conditions indicate fish distribution ends approximately 2/3 mile downstream of the project area in the Trout Creek and 3/4 mile downstream in Slick Rock Creek.

Fish Distribution (Salmon River-Siletz River Watershed)

Chinook and coho salmon, and steelhead trout are present in Trout Creek and Slick Rock Creek (Streamnet 2007). Chinook salmon are located in the lower reaches of Trout Creek and Slick Rock Creek, more than two miles downstream from the project area. Nearest steelhead populations are approximately 0.7 miles from the project area in Trout Creek and one mile from the project area in Slick Rock. The nearest coho salmon populations are more than one mile downstream from the project area in both Trout Creek and Slick Rock Creek. Chinook, coho, and steelhead are adjacent to portions of the unpaved timber haul route in the Bear Creek drainage, and are at least 0.7 miles from all other portions of unpaved timber haul route.

One falls barrier was identified downstream of the project area in the affected watershed; however, the barrier was not considered a barrier to adult salmon migration (Streamnet 2007). Several barrier culverts have been identified along the timber haul route on unpaved county road, these culverts likely block salmon and steelhead migration. Based on field review, Streamnet GIS data, and BLM GIS data there is one paved and one unpaved stream crossing over anadromous fish bearing streams and two unpaved crossings over resident fish habitat associated with the proposed timber haul route within the Salmon River - Siletz River Watershed.

Fish Distribution (Lower Siletz River Watershed)

The proposed treatments do not directly affect lands within the Lower Siletz River Watershed. The proposed action in this system is only timber hauling and road renovation activities. There are no known fish bearing crossings on the timber haul route within the Lower Siletz River watershed. Estimated distance of resident and anadromous species from proposed road renovation is approximately 0.4 miles downstream. Estimated distance of resident and anadromous species from the timber haul route is between 0.4 and 2 miles downstream (BLM 2008).

Special Status Species or Habitat

The Oregon Coast (OC) coho salmon is listed as threatened under the Endangered Species Act. The species is known to occupy habitat approximately one mile downstream from the project areas in both Trout Creek and Slick Rock Creek. There is no known unpaved stream crossing over OC Coho habitat associated with the timber haul route; however, there is one paved crossing over OC Coho habitat. Oregon Coast coho salmon occur downstream from road renovation and timber hauling at least one mile in Slick Rock and $\frac{3}{4}$ miles in Trout Creek. Oregon Coastal Coho habitat is over two miles from unpaved timber haul roads in South Fork Schooner Creek and more than one mile in Upper Schooner Creek. There is unpaved county road, associated with the timber haul route, approximately 100 feet from OC Coho habitat in Bear Creek.

The proposed action for Project 2 is limited to girdling, felling or topping trees over a 32 acre area north of and downslope from Project 1. The proposed action is located near the ridge top between the Slick Rock and Trout Creek drainages. No stream channels are within the project area.

Environmental Effects

3.2.5.1 Alternative 1 (No Action)

Mid-Seral Habitat Enhancement (Project 1) and Late-Seral Habitat and Deciduous Swamp Enhancements (Project 2)

Current timber stand conditions would be maintained. Expected benefits of thinning riparian stands would not be realized. The existing road network would remain unchanged, with no new road construction. Impacts to aquatic habitat would be unlikely with the implementation of the no-action alternative. Short-term snag and CWD recruitment rates would be unchanged and stand conditions would also remain unchanged. Larger CWD would take longer to develop under the no action alternative.

3.2.5.2 Alternative 2 (Proposed Action)

Mid-Seral Habitat Enhancement (Project 1)

Yarding/Falling

Reductions in canopy closure, and vegetative cover, can result in changes in peak or base flows which in turn impair the availability or quality of aquatic habitat. The proposed project would affect less than 4.3 percent of the forest cover in the Trout Creek 7th field watershed (161 acres treated divided by 3,523 acres in drainage), and 0.1 percent of the forest cover in the Slick Rock Creek 7th field watershed (7 acres treated divided by 5,634 acres in drainage). Due to the small

percentage of forest cover being affected, the proposed action was considered unlikely to detectably alter stream flows (Wegner 2008). No discernable changes in peak and base flows within the treatment area are anticipated, hence effects to fish habitat downstream are not anticipated.

Site level project designs for treatment units included a standard design feature SPZ of at least 55 feet or more. Within the thinning treatment units the SPZ widths averages 60 feet wide and none less than 55 feet (Snook 2008). According to the stream shading sufficiency analysis done for the proposed treatments units the proposed no-entry SPZs of 55 feet was sufficient to protect critical shade in the primary shade zone, based on topography and average tree height (Snook 2008). The proposed vegetation treatment in the secondary shade zone (approximately one tree height from the stream) would not result in canopy reduction of more than 45 percent. While the post treatment closure is less than the Northwest Forest Plan TMDL Strategy target of 50 percent post treatment canopy closure there are no known perennial streams in the project area. Channels in the project area that are intermittent / ephemeral are not subject to summer solar warming. Retention of the SPZ buffer and the location of the thinning treatments adjacent to intermittent channels would be expected to maintain the existing stream temperature regimes and the proposed action is unlikely to increase in stream temperatures at the site (Wegner 2008). Based on the shade sufficiency analysis, the hydrology report water quality analysis, and the project design features, the proposed actions are unlikely to affect fish habitat both at the treatment site and downstream.

Loss of CWD and LWD due to harvest can affect the stability and quality of aquatic habitat. Based on the riparian stand analysis the proposed action would retain trees which would reach larger diameters earlier compared to the no treatment option, creating natural opportunities for higher quality LWD recruitment in the long-term (Snook 2008). In the short-term, the smaller woody debris would continue to fall from within the untreated SPZs, and larger wood would begin to be recruited from farther up the slopes as the treated stands reach heights of 180 feet. Thus, wood with a larger range of sizes would potentially be recruited into streams over the long-term in treated stands. As short-term recruitment of the existing CWD is expected to be maintained, the proposed actions are not expected to cause short-term effects to fish habitat at the site or downstream. In the long-term the increase in the size of trees in the RR LUA could beneficially affect LWD recruitment to the stream channel, thus potentially improving the quality/complexity of aquatic habitat adjacent to the treatment areas in the future.

Skidding can compact soil and displace soil thus allowing sediment to be transported down slope and potentially to the stream channel. Skyline corridors can also displace soil thus allowing sediment to be transported down slope and potentially to the stream channel negatively affecting stream channel bedload. However, the proposed actions are unlikely to result in any measurable changes in sediment delivery to the surrounding stream network which could affect the turbidity, substrate composition, or the sediment transport regimes (Wegner 2008). The dominant use of skyline yarding, buffers, residual slash, and use of existing skid trails should keep sediment movement to a minimum. The proposed treatments are unlikely to measurably alter dissolved oxygen or nutrient levels. As the proposed actions are not likely to measurably alter water quality characteristics at the treatment sites, they would be unlikely to affect aquatic habitat downstream from the project area.

Timber Hauling

Timber hauling can increase the risk of sediment reaching stream channels and negatively affect aquatic habitat. There are two segments of gravel surface roads separated by two segments of

paved road. Most of the project area and Lindsey Ridge Road are located near the ridge line and are graveled. There are some problems due to lack of maintenance on portions of the road, but with some basic maintenance conditions would improve. Based on the location of this road segment and distance from fish habitat (greater than 1800 feet) sediment transport would be unlikely to reach fish habitat from this road segment.

Most of USDA Forest Service Road 17 is paved, or chip sealed, and located near ridge tops. Due to the hardened road surfaces, the vegetated ditchlines, and limited hydrologic connectivity of the road, sediment transport would be considered unlikely on this segment.

The lower segment of Bear Creek County Road is paved. The road segment crosses Bear Creek and several other fish bearing streams. In addition, the road parallels Bear Creek for approximately 1.5 miles. Drainage conditions appear to be good, including vegetated ditches. Sediment transport from the hardened road surfaces and the vegetated ditchlines would be considered unlikely on this segment.

The upper segment of Bear Creek Road is graveled and is side slope road leading down to Bear Creek, total length is approximately 1.2 miles (Map1). The road parallels Bear Creek for 2800 feet within 500 feet of listed fish habitat. Ditchline lengths for the affected cross-drains in proximity to fish habitat are between 500 and 1000 feet. Field review indicates that the cross drain do not reach listed fish habitat directly (Wegner 2008c). The road segment appears to be regularly maintained, but the maintenance of the ditches is problematic. The road running surface encroaches on the ditch in several instances and intrusion of cutslope bedrock results in pinching the ditchline forcing drainage to run onto the road from the ditch in a couple of spots. With implementation of proposed site level mitigation, sediment impacts to aquatic habitat are anticipated to minor and undetectable where listed fish reside.

An old slide area associated with the road is less than 50 feet from Bear Creek. The slide area appears to be stable with new vegetation covering previously exposed soils on the fillslope. There are road barriers on the outside running surface of the road to keep traffic away from the edge, and a small rock berm to redirect surface water flow away from the fillslope. The County repaired the slide by moving the road into the hillside sometime around 1996 (Buisman 2008). No subsequent problems have been noted by the county to date. No impacts to aquatic habitat or listed fish habitat are anticipated from hauling thru the slide area with implementation of proposed mitigation (placement of silt fence or bark bag) in the affected ditchline leading to Callow Creek.

The proposed hauling on rock roads is not expected to result in detectable quantities of sedimentation reaching fish bearing streams with the implementation of design features. Sediment that may reach the non-fish bearing streams associated with the haul route crossings would likely be assimilated into the channels before reaching fish habitat (Duncan et al, 1987).

Road Construction/Renovation

The proposed action includes the construction of approximately 5,000 feet of new road. The proposed roads are unlikely to increase drainage network in the watershed as the majority of new construction is located on ridge tops, outside riparian reserves, and no new construction would cross any existing stream channels. All new construction would be seasonally restricted to occur during the dry season, then winterized or decommissioned following harvest. Based on location of new roads and seasonal restrictions, road construction is unlikely to increase sediment or stream flows which may affect stream channels and fish habitat.

No short-term impacts to fish or aquatic habitat are anticipated from the proposed eight miles of road renovation associated with the proposed action. Renovation is not proposed in proximity to any fish bearing crossings, the closest stream crossing is 1/3 miles from fish habitat. All renovation work would be seasonally restricted to occur during the dry season. The proposed road renovation treatments (rocking, grading, ditchline reconstruction, and cross drain replacements) associated with these crossings would be expected to result in a minor short-term increase in erosion in the winter following work, until reestablishment of vegetation in the subsequent growing seasons (Wegner 2008). However, due to the distance of road work to fish habitat, most sediment is expected to be assimilated in stream bedload prior to reaching fish habitat (Duncan et al 1987) and any turbidity generated from renovating the non-fish bearing crossings is expected to be undetectable against background turbidity where fish reside. The proposed road renovation work is intended to improve drainage and road surface conditions, resulting in less erosion into the surrounding area over time.

Rock Quarry Utilization

The proposed utilization of the Lindsey Ridge Quarry is not anticipated to result in any effects to aquatic habitat or fish. The existing quarry is located on the ridge top and there are no known connections from the quarry to the stream network. Transport of rock to new construction and renovation are anticipated to be similar to potential impacts associated with timber hauling (see Timber hauling).

Machine and Hand Pile Burning

Burning piles could produce small areas susceptible to erosion and restricted infiltration (Wegner 2008). However burn area would be surrounded by SPZs and no burning would occur in SPZs. Pile burning with the use of these mitigating features is not anticipated to negatively affect the aquatic environment.

Late-Seral Habitat and Deciduous Swamp Enhancements (Project 2)

Treatments are anticipated to result in negligible ground disturbance; hence, risk of sediment movement occurring at the site level is highly unlikely. Treatments are located away from stream channels and distances are sufficient that no effects to stream temperatures would be anticipated. The low levels of ground disturbance and the distance of treatments from stream channels are not expected to affect LWD recruitment to stream channels. As sediment, temperature, and LWD recruitment are not anticipated to be affected at the site level these effects would not affect aquatic habitat or fish downstream.

3.2.5.3 *Cumulative Effects*

The proposed stand treatments are not expected to alter LWD recruitment, stream bank stability, and sediment supply to channels at the 5th field watershed scale in the short-term or long-term.

Cumulative impacts to fishery resources could occur if proposed actions result in alterations in runoff contributing to changes in flows where fish reside. Based on the Hydrology reports analysis of alterations to peak flows in the project area (Wegner 2008) and the Hydrology Cumulative Effects Analysis (Wegner 2008) changes in flows were considered un-measurable at the site level and are unlikely to contribute to cumulative effects, subsequently, no cumulative effects are anticipated on aquatic resources.

The Hydrology report indicated that the proposed treatments were considered unlikely to have detectable effects on stream temperatures and not expected to result in any cumulative effects to

temperature (Wegner 2008). No cumulative effects are anticipated for peak flows, streambanks, and instream structure which could also affect temperature. Since no cumulative effects were anticipated for these project activities on temperature, streambank conditions, and peak flows these treatments would not result in cumulative effects for fisheries resources.

Based on the project design criteria proposed road construction associated with Project 1 would occur in the Riparian Reserves. Thus, road construction has the potential to affect LWD recruitment and sediment transport to streams at the site level. However the proposed road locations are at least 100 feet from the nearest stream channels. The tallest trees in the project area are no more than 100 feet high (Snook 2008), thus new road construction is unlikely to affect LWD recruitment in the short-term. In the long-term proposed treatments are anticipated to stimulate growth in the remaining timber thus enhancing LWD recruitment (Snook 2008). As short-term LWD recruitment is protected and long-term LWD recruitment is enhanced only slightly positive cumulative effects are anticipated to for instream structure or sediment regimes in Salmon-Siletz River Watershed from the proposed action. Proposed road renovation activities associated with Project 1 are unlikely to reach fish habitat and would not be expected to contribute to any cumulative effects.

Timber hauling may contribute a minor amount of sediment to the stream network during the wet season hauling and follow cessation of timber hauling. Most timber haul routes are located near ridgetops with a limited number of stream crossings. Timber hauling within the Bear Creek drainage is within 200 feet of fish habitat for 1/4 mile; however, site level impacts were expected to be unmeasurable due to the mild road gradients. As site level impacts are not anticipated to be measurable, cumulative effects to aquatic resources would be unmeasurable.

Late seral and deciduous swamp enhancement were not anticipated to result in any site level effects to fish or aquatic habitat therefore the actions associated with Project 2 are not anticipated to contribute to any cumulative effects.

3.2.6 Fuels/Air Quality

(IDT Reports incorporated by reference: Bottleneck LSR Enhancement Project Proposal Fuels Report pp. 1-10)

Affected Environment

Mid-Seral Habitat Enhancement (Project 1) and Late-seral Habitat and Deciduous Swamp Enhancement (Project 2)

Fuels

Project 1 estimated total dead fuel loading ranges from less than 10 up to 20 tons per acre. Much of the existing down material is rotten or only partially sound. There is a light accumulation of small and medium diameter dead woody material and leaf litter on the ground. Larger (greater than 20 inches DBHOB) downed logs are scarce as are large snags. Small snags less than 10 inches DBHOB are common. Aspect of the proposed treatment unit area is generally: southwest and south. A small portion (less than 10 percent) of the unit is flat.

Project 2 estimated total dead fuel loading ranges from less than 10 up to about 40 tons per acre depending on the amount and size of the down logs present. Large down wood is absent over most of the stand so fuel loadings tend toward the lower end of the range. Much of the existing down material is rotten or only partially sound. On the ground there is a light accumulation of

leaf litter along with medium to larger diameter down logs. Only a few large snags are present while medium and small diameter snags are more common but not plentiful. Aspect of Project 2 is north on about 60 percent of the area and southwest to flat on the remaining area.

Air Quality

Air quality in the vicinity of this proposed action is generally very high due to the mid to high elevation Oregon Coast Range location of the project areas. Transport winds affecting the area generally come in off the ocean and keep the air shed scoured out preventing a build up of particulate matter. Occasional stagnant air conditions do develop and may result in accumulation of particulate matter but generally these are short lived lasting less than one week.

Environmental Effects

3.2.6.1 *Alternative 1 (No Action)*

Mid-Seral Habitat Enhancement (Project 1) and Late-seral Habitat and Deciduous Swamp Enhancements (Project 2)

This alternative would result in no change to the affected environment. Short-term impacts to fuels and air quality would be avoided.

3.2.6.2 *Alternative 2 (Proposed Action)*

Mid-Seral Habitat Enhancement (Project 1)

Fuels

Fuel loading, risk of a fire start and the resistance to control a fire, would all increase at the sites as a result of the proposed action. Slash created from timber harvest would add an estimated 7 to 15 tons per acre of dead fuel to the thinned areas. The fuel arrangement would be discontinuous.

Risk of a fire start in the untreated slash would be greatest during the first season following cutting. Fire risk would diminish as the area "greens up" with under story vegetation, and as the fine twigs and branches in the slash begin to break off and collect on the soil surface. Past experience, in the geographic area of this proposed action, has shown that, in approximately 15 years, untreated slash would generally decompose to the point where it no longer contributes significantly to increased fire risk. Depending on the amount of large, down wood left on site from logging, the resistance to control would also decrease over time but more slowly. The resulting total residual dead fuel loading would vary throughout the thinned areas ranging from 5 to 30 tons per acre. It is expected that about half of the dead fuel tonnage to be left on site following treatment would be in the form of down logs and pieces in the 10 inch and larger size class.

Increasing the spacing between the tree crowns would have the beneficial result of decreasing the potential for crown fire occurrence in the treated stands once the slash breaks down. In the first few years following harvest however, if a fire started under dry, summer or early fall conditions, the increased slash loading in the thinned stands would likely result in high stand mortality from scorch and tree torching.

If a market for the slash material develops to the point where it would be economical and energy efficient to remove and transport the fuel to a co-generate power facility, the fire risk could be

substantially reduced. If 60 to 80 percent of the slash material was removed from the site following logging and a fire occurred, the level of stand mortality expected would be very low due to the substantial decrease in expected fire intensity. It is expected that at least 10 to 20 percent of the total fuel loading would have to remain on site in the form of larger size logs and pieces in order to meet the CWD requirements.

Air Quality

The total amount of slash debris expected to be piled for burning is estimated to be approximately 365 tons from the thinned areas. Burning approximately 365 tons of dry, cured, piled fuels under favorable atmospheric conditions in the Oregon Coast Range is not expected to result in any long-term negative effects to air quality in the air shed. Locally within ¼ to ½ mile of the piles there may be some very short-term smoke impacts after piles are ignited resulting from drift smoke. Depending on size, arrangement, type and moisture content of the fuel, the smoke would diminish over several hours or days as the piles cool and burn out (sooner if rain develops). Generally this smoke only affects the immediate area (¼- ½ mile or less) around the pile. Due to the location of this project (over 2000 feet elevation), it is unlikely that inversions would present a problem impacting the local air quality. Burning of slash would always be coordinated with the Oregon Department of Forestry (ODF) and conducted in accordance with the Oregon State Smoke Management Plan. This serves to coordinate all forest burning activities on a regional scale to prevent negative impacts to local and regional air sheds.

Late-seral Habitat and Deciduous Swamp Enhancements (Project 2)

Fuels

Fuel loading, risk of a fire start and the resistance to control a fire, would all increase slightly at the site as a result of the proposed action. Slash created from the selected CWD trees would be created over a period of years since only some of the selected trees would be felled or topped. The remaining selected CWD trees that are girdled would shed dead foliage and branches over a period of years and would eventually fall down. Due to the planned scattered location of the selected trees, the effect on overall fuel loading would be minimal and is not likely to add significantly to the risk of a fire start.

If a fire were to burn on the site, the scattered CWD trees would pose some additional resistance to controlling the fire. The scattered nature of the CWD trees limits this increase to acceptable, manageable levels. Based on the likely size range of the CWD trees, an estimated 5 to 15 tons per acre of scattered (mostly large diameter) dead fuel would be added to the treatment area. The fuel arrangement would be discontinuous.

The slight increase in risk of a fire start in the untreated slash would be greatest during the first season following cutting. Because this fuel would be scattered and discontinuous, it is expected that the increase in fire risk would return to previous levels within 3 years following Project 2 treatment. The increase in resistance to controlling a fire would also decrease over time but more slowly.

The decision to create and leave the CWD untreated under this proposed action is based on our estimate that the risk is manageable based on a long history of observations of fuels in the geographic area. Treating these fuels would negate the benefits of creating them in the first place.

3.2.6.3 *Cumulative Effects*

Although there would be an increase in fuel loading and resultant fire hazard in the short-term, there would be positive net benefits in the long-term due to the proposed thinning treatment. When looked at from a watershed scale, the thinning of approximately 161 acres of forest habitat would reduce the long-term (5 or more years) potential of the stand to carry a crown fire. The localized increase in fire risk would diminish back to background levels within 15 years. If fuels are removed from the site for co-generate power production, fire risk would diminish by a substantial margin immediately.

Project 2 effects would be a slight increase in fuel loading and resultant fire hazard in the short-term but probably not enough to be measurable with any statistical significance especially considering the discontinuous arrangement of the fuels. The localized increase in fire risk would diminish down to historical back round levels within 3 years or less.

There would be few cumulative effects to these resources, as the effects from Project 1 would be local and/or short lived, and there would be no other uses affecting this resource. Based on past experience with pile burning in this and other similar areas, there are no expected cumulative effects on air quality from the planned fuels treatment under this proposal.

3.2.7 **Recreation/Visual Resources**

(IDT Reports incorporated by reference: Recreation/Rural Interface/VRM Report pp. 1-9)

Affected Environment

Mid-Seral Habitat Enhancement (Project 1) and Late-Seral Habitat and Deciduous Swamp Enhancements (Project 2)

Recreation

The proposed project area is characterized by a forest setting and accessed by gravel forest roads. Evidence of human-made modifications (roads, timber harvest) is common on both private and public lands surrounding the project area. Timber management operations are likely to continue on both private and public forest lands in the vicinity of the project areas. There are no developed recreational facilities in the vicinity of the projects. Recreational activities that occur in the vicinity of the project areas may include camping, hiking, hunting, OHV use, target shooting, driving for pleasure, and special forest product harvest.

Visual Resource

The intermixed land ownership pattern between public and private forest land greatly limits the BLM's ability to manage these areas as a contiguous viewshed. Timber management operations near or adjacent to the units are observable from private and public lands. The view from major roads and highways of the surrounding terrain is one of timber management as various age classes of trees are visible.

Class IV designations are managed to allow for a wide variety of activities which require major modification of the existing character of the landscape with high levels of change. Management activities may dominate the view and be the major focus of viewer attention.

The project areas are not observable from major public travel routes, recreation areas, residences, or other key observation points. The rolling mountains block the view from surrounding public

roads and Highway 18. Bureau of Land Management - managed lands are for the most part unidentifiable from other lands when looking at the landscape from any one vantage point. No special visual features or specific concerns were identified in scoping.

Environmental Effects

3.2.7.1 Alternative 1 (No Action)

Mid-Seral Habitat Enhancement (Project 1) and Late-seral Habitat and Deciduous Swamp Enhancements (Project 2)

With the exception of unexpected changes (i.e. wildfire or disease), the project area would continue to provide a forest setting for dispersed recreational activities. A short-term increase in log truck traffic, noise and other inconveniences related to the thinning operations would not occur. However, these inconveniences from other landowners' timber management operations in the vicinity would still occur. No modifications to the landscape character of the project areas would be expected to occur. Modifications to the landscape character in the vicinity of the project area would still be expected, as a result of timber management operations on other lands.

3.2.7.2 Alternative 2 (Proposed Action)

Mid-Seral Habitat Enhancement (Project 1) and Late-seral Habitat and Deciduous Swamp Enhancements (Project 2)

Recreation

A forest setting would be maintained, and vegetation disturbed by operations would be expected to return within five years. Any recreational use in the project areas would be restricted in the short-term during thinning operations (generally during summer months). The thinning operation (if not shutdown due to fire restrictions) would coincide with archery season in late August.

Any new road construction or road work needed to access thinning areas would increase the opportunity for OHV use. However, new roads and skid trails would be decommissioned and blocked reducing the likelihood of new OHV use. After thinning operations, recreation users would continue to use those public lands as in the past. These projects would not hinder any future recreation.

Visual Resources

The removal of some trees in the stands would have a minimal impact to the quality of the viewshed. Changes to the landscape character are expected to be moderate and would comply with VRM Class IV guidelines. Most of the disturbance would be from modifications to vegetation associated with the removal of standing trees. The proposed action would maintain some canopy cover. The areas are expected to return to a more natural appearance within five years as disturbed vegetation returns and the existing canopy grows. There would also be some short-term (days) decline in visual quality as a result of the smoke created when piles are burned.

3.2.7.3 *Cumulative Effects*

The proposed action would moderately alter the landscape. Thinning trees would contribute to the amount of timber cut and/or removed in the watershed, but the amount is minimal. Trees would be thinned (cut and removed) on BLM-managed land in these land use allocations based on silviculture prescriptions and specialists' recommendations and private lands would be harvested. There are alternative areas in the vicinity to do recreational activities while harvest operations and pile burning would occur.

This landscape has and will continually be altered by the BLM, through a strategic plan, and by private timber companies. Clearing all the timber changes the view more than a thinning or scattered removal of trees. Most recreation visitors want a variety of scenery.

As with any timber management, OHV use is an issue when roads are built or improved and monitoring usage would help decrease resource damage. Off-highway-vehicle use areas are diminishing (result of additional road closures) and the closing of overused areas not able to handle such activities.

4.0 Compliance with the Aquatic Conservation Strategy

Existing Watershed Condition

The Bottleneck LSR Enhancement Project areas are in the Salmon River-Siletz River 5th field Watershed which drains into the Salmon River.

Six percent of the watershed is managed by BLM and 94 percent is managed by other landowners. Late seral and/or old-growth forests comprise 32 percent of the BLM-managed lands in the watershed. We can infer then, that commercial harvest or stand replacement fire has occurred on 68 percent of the BLM-managed lands in the watershed. The earliest harvests on BLM-managed lands have been regenerated and are progressing towards providing mature forest structure. Most of the private industrial lands have been and will continue to be moved from mid seral to the early seral class.

Review of Aquatic Conservation Strategy Compliance:

The projects meet the Aquatic Conservation Strategy in the context of PCFFA IV and PCFFA II [complies with the ACS on the project (site) scale]. The following is an update of how these projects comply with the four components of the Aquatic Conservation Strategy. The projects would comply with:

Component 1 – Riparian Reserves: by maintaining canopy cover along all streams and wetlands would protect stream bank stability and water temperature. Riparian Reserve boundaries would be established consistent with direction from the *Salem District Resource Management Plan*. No new road construction would occur within RMP Riparian Reserves;

Component 2 – Key Watershed: by establishing that the Bottleneck LSR Enhancement Projects are not within a key watershed;

Component 3 – Watershed Analysis: The Salmon Neskowin Watershed Analysis (1995) describes the events that contributed to the current condition such as early hunting/gathering by

aboriginal inhabitants, road building, agriculture, wildfire, and timber harvest. The following are watershed analysis findings that apply to or are components of this project:

Projects 1 and 2:

- Early commercial thinnings may be viable treatment options in stands whose ages range from 30 to 79 years. Multiple commercial thinnings may be appropriate for some stands, especially those that are currently near the young end of this range. Dense and/or uniform stands are candidates. Stand condition and other resource management concerns may limit the number of desirable entries. The objectives of early commercial thinnings are to promote the growth of large diameter trees, to encourage the development of some late-successional stand characteristics, and to increase wind-firmness (p. 64).
- Early commercial thinnings will encourage stand variability and spacing variability. This in turn will favor the development of large limbs on some trees and will hasten the development of desirable characteristics within the stand (p. 64).
- Late commercial thinnings may help move densely stocked stands from the competitive exclusion stage into the understory reinitiation phase. Doing so will help to expand existing blocks of late-seral forest and will create linkages between existing late-seral blocks (p. 64).
- Additionally, late commercial thinnings will hasten the development of multiple canopy layers and will promote wind-firmness, especially in stands with prior thinning entries. In many stands, some trees will be large enough to provide for down logs, woody debris, and snags (p. 64).
- Create snags and CWD in areas (not associated with silvicultural treatments) that are currently deficient in these habitat components. Meet or exceed snag and CWD levels following the recommendations of the LSRA (p. 65).
- Conduct treatments in LSRs to accelerate the development of late-successional habitat only in areas that currently lack species and/or structural diversity (p. 67).
- Potential early commercial thin treatment areas were identified by evaluating GIS data for stands in the conifer pole, conifer mix pole, young conifer, and young conifer mix seral classes. These seral classes include stands up to 80 years old. Potential treatment areas on BLM-managed lands occur in the Bald Mountain area (pp 67-68).
- Manage riparian vegetation to protect existing late-successional stands and to maximize growth of earlier successional stands with the objective to provide LWD recruitment and stream shading (p. 70).

Component 4 – Watershed Restoration:

Projects 1 and 2 would restore watershed conditions by providing a gradual transition in structural characteristics of the treated stands that would more closely resemble late-seral forest. These projects would also promote stand diversity, provide more light to accelerate growth of selected conifers and promote species diversity.

These projects have been reviewed against the ACS objectives at the project or site scale with the following results. The no action alternative does not retard or prevent the attainment of any of the

nine ACS objectives because this alternative would maintain current conditions. The Proposed Actions do not retard or prevent the attainment of any of the nine ACS objectives for the following reasons.

Table 11: Project' Consistency with the Nine Aquatic Conservation Strategy Objectives

Aquatic Conservation Strategy Objectives (ACSOs)	Projects 1 and 2 – Mid-Seral Enhancement and Late Seral and Decidious Swamp Enhancement Actions
<p><i>1. Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features.</i></p>	<p>Does not prevent the attainment of <i>ACSO 1</i>. The watersheds where these projects occur lacks structural diversity and CWD. The projects would enhance late-successional forest conditions and speed up attainment of these conditions across the landscape.</p> <p>The proposed action is unlikely to have detrimental cumulative effects on the hydrologic regime. Road renovation practices help to prevent fill failures, slides, washouts, and other disturbances which can alter landscape features and complexity and add sediment to adjacent streams.</p>
<p><i>2. Maintain and restore spatial and temporal connectivity within and between watersheds.</i></p>	<p>Does not prevent the attainment of <i>ACSO 2</i>. No stream crossing culverts would be used that would potentially hinder movement of aquatic species; therefore no aquatic barriers would be created. 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> <p>Renovation of the transportation system would not affect spatial connectivity.</p>
<p><i>3. Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.</i></p>	<p>Does not prevent the attainment of <i>ACSO 3</i>. Minimum 55 foot SPZ's would maintain the integrity of shorelines, banks and stream bottom configurations in the project area. Trees would be directionally felled within one tree height of the SPZ and any part that falls within the SPZ would be left on site, thereby preventing disturbance to stream banks and stream bottom configurations.</p> <p>Roadside ditch and potential culvert installation and placement of surfacing material and surface blading are all intended to reduce the risk of road embankment failures and sediment input into aquatic systems.</p>
<p><i>4. Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems.</i></p>	<p>Does not prevent the attainment of <i>ACSO 4</i>. Stream temperature: According to the stream shading sufficiency analysis, the proposed SPZ's (minimum of 55 feet) was sufficient to protect critical shade in the primary shade zones, based on topography and average tree height. Stream shade would be protected in both projects.</p> <p>Sedimentation and stream turbidity: see No. 5 below</p> <p>Road renovation practices are intended to reduce the likely deposition of road fill material into adjacent streams.</p>
<p><i>5. Maintain and restore the sediment regime under which aquatic ecosystems evolved.</i></p>	<p>Does not prevent the attainment of <i>ACSO 5</i>. The Project is designed to minimize the risk of a mass soil movement event (slump/landslide). Stream protection zones and project design features would minimize any potential sediment from harvest and road-related activities from reaching water bodies. Road renovation and drainage renovations on existing roads would help to restore the sediment regime to streams in the area. Road renovation practices reduce the amount of sediment that enters streams by installing culverts and minimizing road surface and ditch scouring.</p>

Aquatic Conservation Strategy Objectives (ACSOs)	Projects 1 and 2 – Mid-Seral Enhancement and Late Seral and Deciduous Swamp Enhancement Actions
6. <i>Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing.</i>	<p>Does not prevent the attainment of ACSO 6.</p> <p>The proposed projects would not measurably alter instream flows. The project would affect less than 0.004% of the forest cover in the Salmon River Watershed.</p> <p>Proposed projects would entail removing as few trees as necessary. Therefore, direct effects from these projects on cumulative effects to streamflow are too small to be measured with reasonable accuracy.</p>
7. <i>Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.</i>	<p>Does not prevent the attainment of ACSO 7.</p> <p>Design features for the project, such as SPZs, coupled with the relatively small percent of vegetation proposed to be removed, would maintain groundwater levels and floodplain inundation rates. Detectable direct or indirect effects to stream flow as a result of this action are unlikely.</p> <p>The proposed action would not alter existing patterns of floodplain inundation or water table elevation as it would have no effects on existing flow patterns and stream channel conditions.</p> <p>Proper drainage of roads would maintain water tables and flood plain functions.</p>
8. <i>Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands.</i>	<p>Does not prevent the attainment of ACSO 8.</p> <p>The actual riparian areas along streams would be excluded from treatment during the project by designating SPZs. There would be no change to riparian vegetation on banks or within the riparian zones along streams resulting from the proposed projects.</p> <p>The project would require removal of localized vegetation, including occasional trees. Where appropriate, conifers would be replanted in disturbed areas. In the long term the project would have no effect on species or stand structural diversity. Overall diversity of riparian vegetation would not be affected.</p>
9. <i>Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.</i>	<p>Does not prevent the attainment of ACSO 9.</p> <p>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 CWD conditions.</p> <p>Proper drainage of road surfaces and ditches would improve water quality which would benefit riparian dependent species.</p>

5.0 LIST OF PREPARERS

Table 12: List of Preparers

Resource	Name	Initial	Date
Botany TES and SS Plant Species	Ron Exeter	RE	2/23/09
Cultural Resources	Dave Calver	DC	2/23/09
Fisheries/Aquatic Habitat	Scott Snedaker	SS	2/23/09
Fuels/Air Quality	Tom Tomczyk	TT	2/23/09
Water/Soils	Steve Wegner	SW	2/23/09
Natural Resource Specialist	Diane Morris	DM	2/23/09
NEPA	Gary Humbard	GH	2/23/09
Recreation/Visual Resources/Rural Interface	Traci Meredith	TMM	2/23/09
Silviculture/Riparian Ecology	Hugh Snook	HS	2/23/09
Wildlife TES and SS Animal Species	Gary Licata	GL	02/23/09
Road Work	Russ Buswell	RB	2/23/09
Harvest Plan	Cory Geisler	CG	2/23/09

6.0 CONTACTS AND CONSULTATION

6.1 Agencies, Organizations, and Persons Consulted (ESA Section 7 Consultation)

U. S. Fish and Wildlife Service

To address concerns for potential effects to listed wildlife species and potential modification of critical habitats, the proposed action was consulted upon with the USFWS, as required under Section 7 of the Endangered Species Act. Consultation for this proposed action was facilitated by its inclusion within a programmatic Biological Assessment (BA) that analyzed all projects that may modify the habitat of listed wildlife species on federal lands within the Northern Oregon Coast Range during fiscal years 2009 and 2010. The proposed action has been designed to incorporate all appropriate design standards set forth in the BA. This action would be considered a "may affect, not likely to adversely affect" northern spotted owl dispersal habitat and northern spotted owl and marbled murrelet critical habitats. In the resulting Letter of Concurrence (FWS Reference Number 13420-2008-I-0125), after reviewing the effects of the proposed action on the spotted owl and its critical habitat, and the marbled murrelet and its critical habitat, the Service concurred with BLM that the activities, as proposed, are not likely to adversely affect spotted owls or marbled murrelets and are not likely to adversely affect critical habitat for either species.

NOAA NMFS

Consultation with NOAA NMFS is required for all actions which may affect ESA listed fish species and critical habitat. The area where the proposed actions are located has two major stream systems (Salmon River and Siletz River). Oregon Coast coho salmon are listed as threatened under the ESA, as amended, and are known to occur in the Salmon and Siletz River systems.

Protection of EFH as described by the Magnuson/Stevens Fisheries Conservation and Management Act and consultation with NOAA NMFS is required for all projects which may adversely affect EFH of Chinook and coho salmon. The proposed Bottleneck Enhancement

Projects 1 and 2 are not expected to adversely affect EFH due to distance of all activities associated with the projects from occupied habitat. Consultation with NOAA NMFS on EFH is not required for these projects. The proposed actions addressed under these projects would meet the Project Design Criteria established in the *Endangered Species Act Section 7 Formal Programmatic Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for Fish Habitat Restoration Activities in Oregon and Washington, CY2007-CY2012*. Adverse affects to Essential Fish Habitat and application of design features to minimize project affects are covered by this programmatic

6.2 Cultural Resources - Section 106 Consultation and Consultation with State Historical Preservation Office

The project area occurs in the Oregon Coast Range. Survey techniques are based on those described in Appendix D of the *Protocol for Managing Cultural Resource on Lands Administered by the Bureau of Land Management in Oregon*. Post-project survey would be conducted according to standards based on slope defined in the Protocol appendix. Ground disturbing work would be suspended if cultural material is discovered during project work until an archaeologist can assess the significance of the discovery.

6.3 Public Scoping and Notification-Tribal Governments, Adjacent Landowners, General Public, and State County and local government offices

- A scoping letter, dated October 11, 2007, was sent to 16 potentially affected or interested individuals, groups, and agencies. – Two responses were received during the scoping period.
- A description of the projects was included in the June, September and December 2006 and March 2007 project updates to solicit comments on the proposed projects.

6.3.1 EA public comment period

The EA and FONSI will be made available for public review March 4, 2009 to April 2, 2009. The notice for public comment will be published in a legal notice by the *News-Guard* and *News-Times* newspaper. Comments received by the Marys Peak Resource Area of the Salem District Office, 1717 Fabry Road SE, Salem, Oregon 97306, on or before April 2, 2009 will be considered in making the final decisions for these projects.

7.0 MAJOR SOURCES

7.1 Major Sources

7.1.1 Interdisciplinary Team Reports

Exeter, R. 2008. Botanical Report. Marys Peak Resource Area, Salem District, Bureau of Land Management. Salem, OR. Prepared for Bottleneck NEPA File.

Snook, H. 2008. Specialist Report Abstract, Cold Springs Project, Forest Vegetation and Silviculture. Marys Peak Resource Area, Salem District, Bureau of Land Management. Salem, OR. Prepared for Bottleneck NEPA File.

Wegner, S. 2008. Bottleneck Environmental Assessment Soils/Hydro Report. Marys Peak Resource Area, Salem District, Bureau of Land Management. Salem, OR. Prepared for Bottleneck NEPA File.

Licata, G. 2008 Biological Evaluation for Terrestrial Wildlife. Marys Peak Resource Area, Salem District, Bureau of Land Management. Salem, OR. Prepared for Bottleneck NEPA File.

Meredith, T. 2008. Visual, Recreation and Rural Interface Report. Marys Peak Resource Area, Salem District, Bureau of Land Management. Salem, OR. Prepared for Bottleneck NEPA File.

Snedaker, S. 2008. Bottleneck Fisheries Report. Marys Peak Resource Area, Salem District, Bureau of Land Management. Salem, OR. Prepared for Bottleneck NEPA File.

Tomczyk, T. 2008. Project Proposal Fuels Report. Marys Peak Resource Area, Salem District, Bureau of Land Management. Salem, OR. Prepared for Bottleneck NEPA File.

7.1.2 Additional References

USDA Forest Service, USDI. Bureau of Land Management. 1994. Final Supplemental Environmental Impact Statement Management of Habitat for Late Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl. Portland, OR.

USDA Forest Service, USDI. Bureau of Land Management. 1994. Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl and Standards and Guidelines for Management of Habitat for Late Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl. Portland, OR. Note: The ROD and S and G are collectively referred to herein as the Northwest Forest Plan (NFP).

USDA Forest Service and USDI Bureau of Land Management. 2008. Biological Assessment, Fiscal year 2009/2010 habitat modification activities in the North Coast Province which might affect bald eagles, northern spotted owls or marbled murrelets.

USDA Forest Service, USDI. Bureau of Land Management. 2007. Record of Decision To Remove the Survey and Manage Mitigation Measure Standards and Guidelines from Bureau of Land Management Resource Management Plans Within the Range of the Northern Spotted Owl. Portland, OR.

USDC National Marine Fisheries Service (NMFS) Endangered Species Act Section 7 *Informal Consultation for the 2007-2009 Thinning Timber Sales Programmatic on the Mt. Hood and Willamette National Forests and portions of the Eugene and Salem Bureau of Land Management Districts, 20 Watersheds.*

USDI Bureau of Land Management. 1994. Salem District Proposed Resource Management Plan/Final Environmental Impact Statement. Salem, OR.

USDI Bureau of Land Management. 1994. Salem District Watershed Cumulative Effects Analysis Procedure. Salem District BLM, Salem, Oregon. Internal document.

USDI Bureau of Land Management. 1995. Salem District Record of Decision and Resource Management Plan (RMP). Salem District BLM, Salem, OR. 81 pp. + Appendices.

USDA-FS and USDI-BLM, 1999. Salmon-Neskowin Watershed Analysis. Marys Peak Resource Area, Salem District, Bureau of Land Management. Salem, OR. 107 pp.

8.0 Response to Scoping Comments

A scoping letter, dated October 11, 2007, was sent to 16 potentially affected or interested individuals, groups, and agencies. Two responses were received during the scoping period.

8.1 Summary of comments and BLM responses

The following addresses comments raised in one letter from the public received as a result of scoping (40 CFR Part 1501.7). Additional supporting information can be found in Specialists' Reports in the NEPA file. The comments, (in italics type), may have been paraphrased for clarity or conciseness, but the complete text of the comment was available to the Interdisciplinary Team (IDT) making the response. The full text of the comment letter is available in the Bottleneck NEPA/ EA file.

8.1.1 Oregon Wild (October 26, 2007)

1. **Comment:** *“Oregon Wild urges BLM to explore practices of variable density thinning for all stands to be treated, which allows young stands to develop into more complex and resilient forests.”*

Response: We always try to achieve variable density in our LSR treatments, within our operational constraints, and believe that our prescription would accomplish that. We plan to create canopy gaps over the project area which would equal approximately 5 percent of the overall stand, and also to leave small unthinned areas (clumps).

Within the larger gaps we would leave large “wolfy” trees or trees with other wildlife values, releasing them completely so as to promote epicormic branching and deep crowns. Between the gaps, we plan to mark the project in a range of basal areas. We would also reserve all species other than Douglas-fir, to give the stands additional spacing variability.

Although we are primarily thinning from below, the marking guide calls for leaving healthy intermediate trees in place of dominant ones, recognizing that there would be few of them.

2. **Comment:** *Oregon Wild generally does not support new road construction in reserves. Conduct thinning without extensive construction of new roads; provide a stand by stand description of the road spur lengths and the acres each spur accesses for thinning..*

Response: Some new road construction is necessary for operability due to topography present in the project area. The majority of new road construction (except 300 feet) would be located outside Riparian Reserves (generally on ridgetop locations) and would be blocked to vehicular traffic following harvest. In addition BMPs would be followed during road construction to reduce the risk of adverse effects to aquatic resources.

The following table includes the length of each new road to be constructed and the number of acres accessed by each road and then computed the cost:benefit ratio of the number of acres treated per mile of road construction.

Road #	Primary Road Work	Miles	Associated Unit Acres	Acres of Unit/Mile of Road
P1	New	0.47	65	138
P2	New	0.22	45	205
P3	New	0.29	32	110
P4	New	0.05	18	360

3. **Comment:** *Oregon Wild would be disappointed to see large trees cut in late-seral habitat in order to “release” other large trees.*

Response: Trees to be cut or girdled within Project 2 would not be greater than 36 inches DBHOB, with the majority of trees less than 30 inches DBHOB.

4. **Comment:** *Thinning activities in Riparian Reserves should not result in yarding corridors, roads, or other activities impacting water quality and aquatic habitat.*

Response: As stated in the EA (p. 51) “It is unlikely that the proposed projects would lead to measurable increases in sediment delivery to streams, stream turbidity, the alteration of stream substrate composition, or sediment transport regime. Stream protection zones would eliminate disturbance of streamside vegetation; no trees would be cut from the stream bank or where roots are stabilizing the stream bank”.

Skyline and ground-based skid trails, if sufficiently compacted, could route surface water and sediment into streams. However, several factors would limit the potential for this to occur. Even if compacted, high levels of residual slash left on yarding corridors (both machine and skyline), would reduce runoff by deflecting and redistributing overland flow laterally to areas where it would infiltrate into the soil. Existing skid trails would be used for ground-based equipment as much as possible to reduce additional soil compaction and the total surface area of landings would be kept to a minimum. In addition SPZs in riparian areas have high surface roughness, which function to trap any overland flow and sediment before reaching streams. Ground-based skidding would occur during periods of low soil moisture with little or no rainfall, in order to minimize soil compaction and erosion.

As stated in the EA (pp. 56, 57) “Channels in the project area that are intermittent / ephemeral are not subject to summer solar warming. Retention of the SPZ buffer and the location of the thinning treatments adjacent to intermittent channels would be expected to maintain the existing stream temperature regimes and the proposed action is unlikely to increase in stream temperatures at the site”.

As short-term recruitment of the existing CWD is expected to be maintained, the proposed actions are not expected to cause short-term effects to fish habitat at the site or downstream. In the long-term the increase in the size of trees in the RR LUA could beneficially affect LWD recruitment to the stream channel, thus potentially improving the quality/complexity of aquatic habitat adjacent to the treatment areas in the future.

5. **Comment:** *Special Status Species surveys must be completed prior to developing NEPA alternatives and before the decision is determined.*

Response: All SS Species surveys would be completed to protocol and be in compliance with the 2007 ROD. Prior to developing project design features, an extensive amount of on the ground reconnaissance surveys was completed in the project areas. Any red alders to be felled within Project 2 area would be surveyed for lichen and bryophyte SS species prior to felling.

6. **Comment:** *Project analysis should separately discuss each of the Aquatic Conservation Strategy objectives.*

Response: Each ACS objective was addressed separately in the EA (Section 4 Table 10).

7. **Comment:** *A full range of action alternatives should be considered for this project.*

Response: The proposed action alternative for Projects 1 and 2 would develop mid and late seral stands toward late-successional forest conditions by accelerating the growth of conifer trees and by restoring habitat (e.g. CWD, snag habitat, in-stream large wood) through variable density thinnings.

Wildlife habitat would be enhanced by creating immediate CWD. A gradual transition in structural characteristics of the treated stands that more closely resemble late-seral forest (larger diameter trees, sub-canopy development, greater tree species diversity, greater volume and size of hard CWD, canopy gaps) would be accomplished. In addition, the extended persistence of hardwood tree and shrub cover diversity would be maintained.

8.1.2 American Forest Resources Council (October 31, 2007)

1. **Comment:** *“The AFRC would like to see all timber sales be economically viable.”*

Response: Economic feasibility is one of the many factors taken into account when offering a timber sale. Road work costs, yarding costs and other incidental costs versus the acreage and volume taken are calculated and an Interdisciplinary Team of specialists including those in EA Section 5.0, Table 11, come to a consensus on what alternative to pursue for analysis.

2. **Comment:** *Seasonal restrictions have a cost to the Purchaser and result in a lower bid cost. AFRC would encourage the BLM to allow winter hauling since this would provide wood for the mills and work for the loggers during the winter months.*

Response: Winter hauling would be allowed to occur in Project 1 of this action (section 3.2.3.2 p. 39).

3. Comment: *The AFRC would like to see flexibility for fuels treatments. Rather than specifying a method of accomplishing resource objectives, BLM should identify objectives and any limitations to resource disturbance. The purchaser could then identify the method they could implement given their particular employee skills and equipment mix.*

Response: The purpose of the fuels treatment recommended in the EA is to reduce or mitigate slash hazard and risk along roads and landings. Besides the option of hand or machine piling of slash concentrations, the EA (p. 11) specifies: “When ever possible alternative waste recycling of slash material should be encouraged. This may be: providing firewood to the public, chipping for co-gen power production, chipping for soil amendments, soil protection, etc.” This is an attempt to provide some flexibility that will still meet the objective of reducing fire hazard and risk. However, leaving slash concentrations along roads and landings would not be an option.

4. Comment: *The AFRC would like to see thinning treatments with smaller (25-60 feet) no cut buffers to achieve management objectives of moving the RR into Late-Successional forest faster. We encourage the BLM to maximize opportunities in the RR LUA.*

Response: The minimum width of the SPZs for this project is 55 feet which falls into the desired range that you indicated you would like to see thinning occur. The primary shade zone (USDI 2005) width is determined by the existing height of the riparian trees and the slope of the ground in the unit. This distance ranges from 50 to 60 feet slope distance. As mentioned above the minimum no cut width for this project is 55 feet which falls into your desired widths.

Appendix 1 – North and Central Coast Range Physiographic Map Bottleneck LSR Enhancement

