McFall/Potter Creek Density Management and Aquatic Habitat Restoration Environmental Assessment and Finding of No Significant Impact

Environmental Assessment Number OR-080-06-12

November 20, 2007

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
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BLM
Salem District

Abstract: This EA (Environmental Assessment) discloses the predicted environmental effects of three projects on federal land located in Township 8 South, Range 8 West, Section 35 and Township 8 South, Range 7 West, Section 31, Willamette Meridian and within the Upper Siletz River watershed.

- ✓ Project 1 (McFall Creek Density Management) is a proposal to increase structural diversity and implement the BLM (Bureau of Land Management) DMS (Density Management and Riparian Buffer Study) on approximately 317 acres of forested land.
- ✓ Project 2 (Potter Creek Density Management) is a proposal to increase structural diversity on approximately 170 acres of mid-seral forested land.
- ✓ Project 3 (Aquatic Habitat Restoration) is a proposal to develop or enhance aquatic habitat.

The actions would occur within AMA (Adaptive Management Area) and RR (Riparian Reserve) LUAs (Land Use Allocations) within the NCAMA (Northern Coast Range Adaptive Management Area).

FINDING OF NO SIGNIFICANT IMPACT

Introduction

The BLM (Bureau of Land Management) has conducted an environmental analysis (Environmental Assessment Number OR080-06-12) for a proposal to implement three projects in AMA (Adaptive Management Areas) and RR (Riparian Reserve) LUA (Land Use Allocations) within the NCAMA (Northern Coast Range Adaptive Management Area) as follows:

- ✓ *Project 1*: Conduct density management on approximately 317 acres of 72 to 79 year-old stands to increase structural diversity and implement treatments for research purposes as part of the BLM DMS (Density Management and Riparian Buffer Study).
- ✓ *Project 2*: Conduct density management on approximately 170 acres of 66 to 70-year-old stands to increase structural diversity.
- ✓ *Project* 3: Develop or enhance instream fish habitat.

Project 1 is on BLM-managed lands in Township 8 South, Range 7 West, Section 31 and Projects 2 and 3 are located on lands in Township 8 South, Range 8 West, Section 35, Willamette Meridian.

Implementation of the Proposed Actions would conform to management actions and direction contained in the attached McFall/Potter Creek EA *(McFall/Potter Creek Density Management and Aquatic Habitat Restoration Environmental Assessment).* The McFall/Potter Creek EA is attached to and incorporated by reference in this FONSI *(Finding of No Significant Impact)* determination. The analysis in this EA (Environmental Assessment) is site-specific and supplements analyses found in the RMP/FEIS *(Salem District Proposed Resource Management Plan/Final Environmental Impact Statement,* September 1994) (EA p. 1). The McFall/Potter Creek projects have been designed to conform to the RMP *(Salem District Record of Decision and Resource Management Plan*, May 1995) and related documents, which direct and provide the legal framework for management of BLM-managed lands within the Marys Peak Resource Area (EA pp. 1-2). Consultation with US Fish and Wildlife Service and National Marine Fisheries Service are described in section 9.1 of the EA.

The EA and FONSI will be 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 November 28, 2007 to December 27, 2007. The notice for public comment will be published in a legal notice by the *Polk County Itemizer Observer* newspaper. Comments received by the Marys Peak Resource Area of the Salem District Office, 1717 Fabry Road SE, Salem, Oregon 97306, on or before December 27, 2007 will be considered in making the decisions for these projects.

Finding of No Significant Impact

Based upon review of the McFall/Potter Creek 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 Upper Siletz River fifth-field watershed and the project areas boundaries. The Proposed Actions would occur on approximately 487 acres of BLM AMA and RR

LUAs land within the NCAMA, encompassing less than 0.9 percent of the forest cover within the Upper Siletz River watershed [40 CFR 1508.27(a)].

Intensity:

1. The effects of commercial thinning are unlikely to a 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 [T&E (Threatened/Endangered), special status species, and structural/habitat components], air quality and fire hazard/risk, botany (special status species, invasive/nonnative species), fisheries and aquatic habitat (T&E species), recreation, and visual resources.

   Design features were incorporated into the Proposed Action for all project areas that would reduce the risk of adverse effects to the above resources (EA sections 2.5.2, 4.4.2, and 5.4.1). 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 and wildlife habitat components;
   - To protect against expansion of invasive and non-native plant species;
   - To protect the residual stand;
   - To minimize disturbance to federal Threatened and Endangered Species;
   - To protect BLM-managed Special Status plant and animal species;
   - To reduce potential hazards to high-use recreation and visual resource areas;
   - To reduce fire hazard risk and protect air quality;
   - To protect cultural resources.

2. *Projects 1 – 3 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 areas (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 action cause loss or destruction of significant scientific, cultural, or historical resources [40 CFR 1508.27(b)(8)] (EA section 3.1).

3. *Projects 1 – 3* 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 – 3* 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 – 3* 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 project's scope (effects

are likely to be too small to be measurable), scale (project areas totaling 487 acres, encompassing less than 0.9 percent of the forest cover within the Upper Siletz River watershed), and duration (direct effects would occur over a maximum period of 4 to 6 years) (EA section 6.0).

6. *Projects 1 – 3* are not expected to adversely affect endangered or threatened species or habitat under the ESA (Endangered Species Act) of 1973 [40 CFR 1508.27(b) (9)].

Wildlife:

To address concerns for effects to federally listed wildlife species and potential degradation of critical habitats, the proposed action has been consulted upon with the U.S. Fish and Wildlife Service, as required under Section 7 of the ESA. Consultation for this proposed action was facilitated 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 2007 and 2008. The resulting Letter of Concurrence (ref# 1-7-06-I-0190, dated August 1, 2006) concurred with the BA, that this action was not likely to adversely affect spotted owl, marbled murrelets or their critical habitats. This proposed action has been designed to incorporate all appropriate design standards set forth in the Biological Assessment which forms the basis for compliance with the Letter of Concurrence.

Fish:

Protection of EFH (Essential Fish Habitat) as described by the Magnuson/Stevens Fisheries Conservation and Management Act and consultation with NOAA NMFS (US Department of Commerce National Oceanic and Atmospheric Administration National Marine Fisheries Service) is required for all projects that may adversely affect EFH of Chinook salmon. The proposed McFall/Potter Creek projects are not expected to affect EFH due to distance of all activities associated with the projects from occupied habitat.

A determination has been made that these proposed projects would have 'no effect' on UWR (Upper Willamette River) steelhead trout, Chinook salmon, and Oregon chub. Generally, the 'no effect' determination is based on the distance upstream of project activities (approximately 1 and 24 miles downstream) from ESA listed fish habitat and project design criteria that include no harvest activity within stream protection zones and post-project leave tree densities of 25-65 trees per acre.

7. *Projects 1 – 3* 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: Traci Meredith — 11/20/07
Traci Meredith, Team Lead — Date

Reviewed by: Gary Humpard — 11/19/07
Gary Humpard, NEPA — Date

Approved by: Trish Wilson — 11/20/07
Trish Wilson, Field Manager — Date
Marys Peak Resource Area

Glossary: Abbreviations, Acronyms, and Terms

ACEC	Area of Environmental Concern. Lands where special management attention is needed to protect and prevent irreparable damage to important values, resources or other natural systems or processes.
ACS	Aquatic Conservation Strategy. A set of objectives developed to restore and maintain the ecological health and aquatic habitat of watersheds.
ACS/FSEIS	Final Supplemental Environmental Impact Statement, Clarification of Language in the 1994 Record of Decision for the Northwest Forest Plan National Forests and Bureau of Land Management Districts Within the Range of the Northern Spotted Owl, October 2003.
Adaptive Management	The continuing process of implementing policy decisions as scientifically driven management experiments that test predictions and assumptions in management plans, and using the resulting information to improve the plans.
Airshed	A geographic area that shares the same air mass due to topography, meteorology, and climate.
Alternative	Proposed project (plan, option, choice)
AMA	Adaptive Management Area. Landscape units designated for development and testing of technical and social approaches to achieving desired ecological, economic, and other social objectives.
Anadromous Fish	Species that migrate to oceans and return to freshwater to reproduce.
Basal Area (BA)	The cross section area of a tree measured in square feet.
BLM	Bureau of Land Management. Federal agency within the Department of Interior responsible for the management of 275 million acres.
BMP	Best Management Practice(s). Design features and mitigation measures to minimize environmental effects.
BO	Biological Opinion. The document resulting from formal consultation that states the opinion of the Fish and Wildlife Service or National Marine Fisheries Service as to whether or not a federal action is likely to jeopardize the continued existence of listed species or results in destruction or adverse modification of critical habitat.
CEQ	Council of Environmental Quality, established by the National Environmental Policy Act of 1969
CEQ Regulations	Regulations that tell how to implement NEPA
Commercial Thinning	Cutting trees to take to the mill for processing.
Crown	The 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.
DBHOB	Diameter at breast height outside bark and all.
Density Management	Reduction and composition of trees in a stand for purposes other than timber production.
DMS	The BLM's Western Oregon Density Management Study, a cooperative study of the effect of silvicultural practices on vegetation, microclimate and riparian systems
EA	Environmental Assessment. A systematic analysis of site-specific activities used to determine whether such activities have a significant effect on the quality of the human environment.
EFH	Essential Fish Habitat. Anywhere Chinook or coho salmon could naturally occur.
EIS	Final Supplemental Environmental Impact Statement to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines, January 2004.
Ephemeral Streams	Streams that contain running water only sporadically, such as during and following storm events.
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
FSEIS	Final Supplemental Environmental Impact Statement
Fish and Wildlife Service	FWS. A division within the U.S. Department of the Interior
Fish-Bearing Stream	Any stream containing any species of fish for any period of time.
FLPMA	Federal Land Policy Management Act (1976)
FONSI	Finding of No Significant Impact
Fuel Loading	The amount of combustible material present per unit of area, usually expressed in tons per acre (dry weight of burnable fuel)
Girdle	Removal of the inner bark from the entire circumference of a tree. This typically results in the death of the tree within 3 to 5 years.
Ground Base Yarding	Utilizing equipment operating on the surface of the ground to move trees or logs 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, strip the tree of limbs, 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.
Helicopter yarding	Moving trees or logs by helicopter to a landing where they can be processed or loaded.
Interdisciplinary Team	IDT. A group of individuals assembled to solve a problem or perform a task.
Intermittent Stream	Any nonpermanent flowing drainage feature having a definable channel and evidence of scour or deposition. Includes ephemeral streams if they meet these two criteria.
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 hauling
Late-Successional	Forest conditions consisting of larger trees and multiple canopy layers that support numerous plant and animal species.
LSR	Late-Successional Reserve (a NWFP designated land use allocation) Lands to be managed or maintained for older forest characteristics.
LSRA	Late-Successional Reserve Assessment for Oregon Coast Province – Southern Portion
LUA	Land Use Allocation. NWFP designated lands to be managed for specific objectives
LWD	Large Woody Debris. Woody 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)
Mesic	Pertaining to or adapted to an area that has a balanced supply of water, neither wet nor dry.
Native Plant	Species that historically occurred or currently occur in a particular ecosystem and were not introduced
NCAMA	North Coast Adaptive Management Area.
NEPA	National Environmental Policy Act (1969)
NMFS	National Marine Fisheries Service. Federal agency within NOAA which is responsible for the regulation of anadromous fisheries in the U. S.
NOAA	National Oceanic Atmospheric Administration. Agency within the Department of Commerce responsible for monitoring and regulating resources associated with the oceanic and atmospheric environments
Non-Native Plant	Any plant species that historically does not occur in a particular ecosystem

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).
NWFP/FSEIS	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, February 1994
ODEQ	Oregon Department of Environmental Quality
ODFW	Oregon Department of Fish and Wildlife. Oregon State Agency responsible for the management and protection 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.
ORGANON	A computer based program used to model projected tree growth, stand density and crown ratio using existing stand tree species and size.
PCT	Precommercial thinning. Removing some of the trees less than merchantable size from a stand so that the remaining trees grow faster.
Perennial Stream	A stream that typically has running water on a year-round basis.
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 work that generally includes removal of culverts, re-establishment of natural drainage patterns, and blocking.
Road Reconstruction	Road work to restore a damaged or deteriorated road to a usable condition and possibly a new design standard.
Road Renovation	Road work that restores an existing road to its original design standard.
ROD	Record of Decision. Document that approves decisions to the analyses presented in the FEIS.
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.
S&M FSEIS	Final Supplemental Environmental Impact Statement for Amendment to the Survey and Manage, Protection Buffer, and Other Mitigation Measures Standards and Guidelines (2000).
S&M ROD	Record of Decision and Standards and Guidelines for Amendment to the Survey and Manage, Protection Buffer, and Other Mitigation Measures Standards and Guidelines (2001).
Seral	One stage of a series of plant communities that succeed one another.
Silviculture	The manipulation of forest stands to achieve desired structure.
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 dead, partially dead, or defective tree at least 10 inches DBHOB and 6 feet tall.
Soil Compaction	An increase in bulk density and a decrease in soil porosity resulting from applied loads, vibration, or pressure.
Soil Productivity	Capacity or suitability of a soil, for establishment and growth of a specified crop or plant species, primarily through nutrient availability.
SPZ	Stream Protection Zone is a buffer along streams and identified wet areas where no material would be removed and heavy machinery would not be allowed. The SPZ is measured to the slope break, change in vegetation, or 50 feet from the channel edge which ever is greater.
SSSP ROD	Record of Decision to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines in Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl, 2004
SSSP/SEIS	Supplemental Environmental Impact Statement to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines, 2004
Standards and Guidelines	S&G. The primary instructions for land manager. Standards address mandatory actions, while guidelines are recommended actions necessary to a land management decision.
Succession	The stages a forest stand makes over time as vegetation competes and natural disturbances occur. The different stages in succession are often referred to as seral stages.

Topped	Completely severing the upper portion of a standing live tree. The typical purpose for this action is to enhance wildlife habitat by creating snags from standing live trees.
Turbidity	Multiple environmental sources that causes water to change conditions.
USDI	United States Department of the Interior
USEPA	United States Environmental Protection Agency
Viewshed	The landscape that can be directly seen from a viewpoint or along a transportation corridor.
VRM	Visual Resource Management, all lands are classified from 1 to 4 based on visual quality ratings and the amount of modification allowed in the landscape.
Waterbars	A ridge of compacted soil or loose rock or gravel constructed across disturbed rights-of-way and similar sloping areas.
Watershed	The drainage basin contributing water, organic matter, dissolved nutrients, and sediments to a stream or lake.
Weed	A plant considered undesirable and that interferes with management objectives for a given area at a given point in time.
Wind Throw	Trees uprooted or blown over by natural events.
Yarding Corridors	Corridors cut through a stand of trees to facilitate Skyline yarding. Cables are strung in these corridors to transport logs from the woods to the landing.

MCFALL/POTTER CREEK DENSITY MANAGEMENT
ENVIRONMENTAL ASSESSMENT

Table of Contents

1.0 INTRODUCTION

1.1 Projects Covered in this EA (Environmental Assessment)

Three projects will be analyzed in this EA.

- ✓ Project 1, McFall Creek Density Management, is a proposal to perform density management on approximately 317 acres of 72 to 79-year-old stands within AMA (Adaptive Management Area) and RR (Riparian Reserve) LUAs (Land Use Allocations). Approximately 224 acres of Project 1 are part of the DMS [The BLM (Bureau of Land Management) Western Oregon Density Management and Riparian Buffer Study] conducted in coordination with OSU (Oregon State University) College of Forestry and USDA (United States Department of Agriculture) Forest Service PNW (Pacific Northwest Research Station). The remaining approximately 93 acres proposed for density management are not within the DMS.
- ✓ Project 2, Potter Creek Density Management, is a proposal to perform density management on approximately 170 acres of 66 to 70-year-old stands within AMA and RR LUAs.
- ✓ Project 3, Aquatic Habitat Enhancement, is a proposal to fell logs in Potter and McSherry Creeks within RR.

1.1.1 Relationship between Projects

Projects occur within the Upper Siletz River watershed.

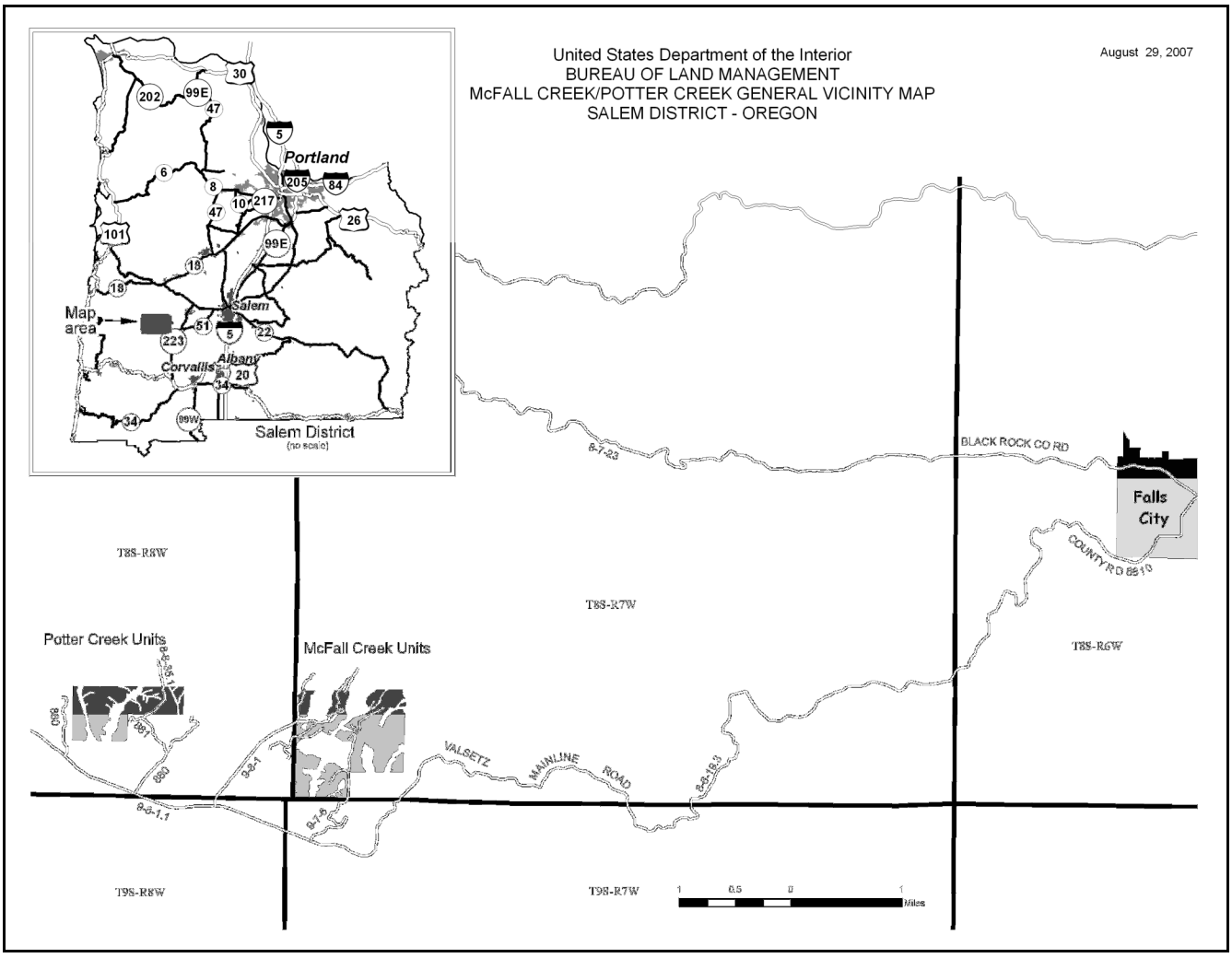
1.2 Project Area Location

The project areas are located approximately 7 and 9 air miles southwest of Falls City, Oregon, in Polk County on forested land managed by the Marys Peak RA (Resource Area), Salem District BLM. They are within Township 8 South, Range 7 West, Section 31 and Township 8 South, Range 8 West, Section 35, Willamette Meridian (see Map 1).

Table 1: Project Area Locations

Project Area	*Township and Range (Willamette Meridian)*	*Section*
McFall Creek Density Management (Project 1)	8 South, 7 West	31
Potter Creek Density Management (Project 2)	8 South, 8 West	35
Aquatic Habitat Restoration (Project 3)	8 South, 8 West	35

Map 1: Vicinity Map



1.3 Conformance with Land Use Plans, Policies, and Programs

The McFall/Potter Creek projects have been designed to conform to the following documents which direct and provide the legal framework for management of BLM lands within the Salem District:

- RMP (*Salem District Record of Decision and Resource Management Plan*, May 1995): The RMP has been reviewed and it has been determined that the McFall/Potter Creek projects conform to the land use plan terms and conditions (e.g. complies with management goals, objectives, direction, standards and guidelines) as required by 43 CFR 1610.5 (BLM Handbook H1790-1). Implementing the RMP (RMP p. 1-3) and Instruction Memorandum (IM) OR-2005-083 (Appendix 3) is the reason for doing Project 1 while implementing the RMP (p. 1-3) is the reason for doing Projects 2 and 3;

- NWFP [Northwest Forest Plan (*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*), April 1994];

- *Record of Decision to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines in Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl*, March 2004 and *Supplemental Environmental Impact Statement to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines*, (SSSP/SEIS) January 2004.

The analysis in the McFall/Potter Creek EA (McFall/Potter Creek Density Management and Aquatic Habitat Restoration Environmental Assessment) is site-specific and supplements analyses found in the RMP/FEIS (*Salem District Proposed Resource Management Plan/Final Environmental Impact Statement*, September 1994). The RMP/FEIS includes the analysis from the NWFP/FSEIS (*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*, 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 McFall/Potter Creek projects:

- LSRA (Late-Successional Reserve Assessment for Oregon's Northern Coast Range Adaptive Management Area), 1998;

- USWA (Upper Siletz Watershed Analysis, 1996);

- APU (South Fork Siletz Activity Planning Report, 2004);

- IM OR-2005-083, dated August 12, 2005, that directs the Districts with established study sites to implement the next phase of the DMS. The Callahan Creek and Sand Creek study sites (see Map 2) are two of twelve sites referenced in the IM and scheduled for implementation in 2009; and

- Callahan Creek Adaptive Management Project EA (OR080-96-12), dated March 11, 1996.

All of the above documents, along with the McFall/Potter Creek IDT (interdisciplinary team) reports (EA section 10.1.1), are hereby incorporated by reference in the McFall/Potter Creek EA and available for review in the Salem District Office. Additional information about the proposed projects is available in the NEPA file (McFall/Potter Creek Density Management and Aquatic Habitat Restoration NEPA/EA File), also available at the Salem District Office.

Survey and Manage Review

The Marys Peak RA is aware of the August 1, 2005, US District Court order in Northwest Ecosystem Alliance et al. v. Rey et al. which found portions of the EIS (*Final Supplemental Environmental Impact Statement to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines*, January, 2004) inadequate. The RA is also aware of the recent January 9, 2006, court order which:

- set aside the 2004 SSSP ROD (*Record of Decision To Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines in Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern spotted Owl,* March, 2004) and
- reinstate the 2001 S&M ROD (*Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measure Standards and Guidelines*, January, 2001), including any amendments or modifications in effect as of March 21, 2004.

The BLM is also aware of the November 6, 2006, Ninth Circuit Court opinion in Klamath-Siskiyou Wildlands Center et al. v. Boody et al., No. 06-35214 (CV 03-3124, District of Oregon). The court held that the 2001 and 2003 Annual Species Reviews (ASRs) regarding the red tree vole are invalid under the Federal Land Policy and Management Act (FLPMA) and National Environmental Policy Act (NEPA) and concluded that the BLM's Cow Catcher and Cotton Snake timber sales violate federal law.

This court opinion is specifically directed toward the two sales challenged in this lawsuit. The BLM anticipates the case to be remanded to the District Court for an order granting relief in regard to those two sales. At this time, the ASR process itself has not been invalidated, nor have all the changes made by the 2001-2003 ASR processes been vacated or withdrawn, nor have species been reinstated to the Survey and Manage program, except for the red tree vole. The court has not yet specified what relief, such as an injunction, will be ordered in regard to the Ninth Circuit Court opinion. Injunctions for NEPA violations are common but not automatic.

We do not expect that the litigation over the Annual Species Review process in Klamath-Siskiyou Wildlands Center et al. v. Boody et al will affect Projects 1 - 3 because the development and design of these projects exempt them from the Survey and Manage program. In Northwest Ecosystem Alliance et al. v. Rey et al, the U.S. District Court modified its order on October 11, 2006, amending paragraph three of the January 9, 2006 injunction. This most recent order directs:

"Defendants shall not authorize, allow, or permit to continue any logging or other ground-disturbing activities on projects to which the 2004 ROD applied unless such activities are in compliance with the 2001 ROD (as the 2001 ROD was amended or modified as of March 21, 2004), except that this order will not apply to:

a. Thinning projects in stands younger than 80 years old;
b. Replacing culverts on roads that are in use and part of the road system, and removing culverts if the road is temporary or to be decommissioned;
c. Riparian and stream improvement projects where the riparian work is riparian planting, obtaining material for placing in-stream, and road or trail decommissioning; and where the stream improvement work is the placement large wood, channel and floodplain reconstruction, or removal of channel diversions; and
d. The portions of project involving hazardous fuel treatments where prescribed fire is applied. Any portion of a hazardous fuel treatment project involving commercial logging will remain subject to the survey and management requirements except for thinning of stands younger than 80 years old under subparagraph a. of this paragraph."

"On July 25, 2007, the Under Secretary of the Department of Interior signed the Record of Decision To Remove the Survey and Manage Mitigation Measure Standards and Guidelines from Forest Service Land and Resource Management Plans Within the Range of the Northern Spotted Owl that removed the survey and manage requirements from all of the BLM resource management plans (RMPs) within the range of the northern spotted owl. In any case, these projects fall within at least one of the exceptions listed above in the modified October 11, 2006 injunction."

Compliance with the Aquatic Conservation Strategy

On March 30, 2007, the District Court, Western District of Washington, ruled adverse to the U. S. Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration (NOAA-Fisheries) and USFS and BLM (Agencies) in *Pacific Coast Fed. of Fishermen's Assn. et al v. Natl. Marine Fisheries Service, et al and American Forest Resource Council,* Civ. No. 04-1299RSM (W.D. Wash)(PCFFA IV). Based on violations of the Endangered Species Act (ESA) and the National Environmental Policy Act (NEPA), the Court set aside:

- The USFWS Biological Opinion (March 18, 2004),
- The NOAA-Fisheries Biological Opinion for the ACS Amendment (March 19, 2004),
- The ACS Amendment Final Supplemental Environmental Impact Statement (FSEIS) (October 2003), and
- The ACS Amendment adopted by the Record of Decision dated March 22, 2004.

Previously, in *Pacific Coast Fed. Of Fishermen's Assn. v. Natl. Marine Fisheries Service,* 265 F.3d 1028 (9th Cir. 2001)*(PCFFA II),* the United States Court of Appeals for the Ninth Circuit ruled that because the evaluation of a project's consistency with the long-term, watershed level ACS objectives could overlook short-term, site-scale effects that could have serious consequences to a listed species, these short-term, site-scale effects must be considered. The following paragraphs show how the McFall/Potter Creek Projects meet the Aquatic Conservation Strategy in the context of PCFFA IV and PCFFA II.

1.4 Decision Criteria/Project Objectives for Each Project

The Marys Peak RA 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 2.2, 4.1 and 5.1).
- 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 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 June 29, 2006, was sent to 42 potentially affected and/or interested individuals, groups, and agencies. Two responses were received during the scoping period.

American Forestry Resource Council (AFRC)

American Forestry Resource Council provided the following statements or requests:

- *AFRC would like to see all timber sales be economically viable*.
- *AFRC would prefer to have units not tied to a specific harvesting system, instead specify what the end result of the unit should be…, and allow the purchaser to select the most appropriate harvesting system to achieve the goals of the BLM.*
- *Traditional harvesting systems (Ground-Based or Skyline Yarding) should be used when possible to achieve an economically viable sale and increase the revenues to the government.*

- *AFRC would like for sales to allow winter harvesting on improved roads or allow for roads to be improved so winter harvesting can be accomplished.*
- *AFRC would also like to suggest the use of small patch cuts to provide early successional habitat for species such as Columbian black-tailed deer and Roosevelt Elk.*

Oregon Natural Resource Council (ONRC)

Oregon Natural Resource Council provided the following statements or requests:

- *We understand that you are working with the PNW Research Station on a new research unit. But we must question your proposal to harvest the non-research portion of the 100 year old forest.*
- *Thinning should be done using variable density prescriptions.*
- *In the McFall Creek project, we commend you for decommissioning the three spur roads that will no longer be needed.*
- *In the Potter Creek project, we are concerned about the amount of new roads proposed.*
- *We feel that temporary road construction is more appropriate than permanent road construction. ONRC believes it is possible for BLM to conduct young stand thinning without extensive construction of new roads.*
- *BLM should do an analysis that illuminates how many acres of thinning are reached by each road segment so that we can distinguish between short segments of spur that allow access to large areas…and long spurs that access small areas.*
- *Be sure that this project complies with 2001 Survey and Manage guidelines. 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 alternatives should be considered for this sale.*

2.0 PROJECT 1 – MCFALL CREEK DENSITY MANAGEMENT

2.1 Density Management Study Background

The BLM, USDA Forest Service PNW, USGS (US Geological Survey), and OSU College of Forestry established the DMS in 1994 to demonstrate and test options for young stand management to meet NWFP objectives in western Oregon. The primary objectives of the DMS is to evaluate the effects of alternative forest density management treatments in young stands on the development of important late-successional forest habitat attributes and to assess the combined effects of density management and alternative riparian buffer/SPZ (stream protection zone) widths on aquatic and riparian ecosystems.

The DMS consists of three integrated studies: initial thinning, rethinning, and riparian buffer study (SPZ widths).

Initial Thinning

The initial thinning study occurred in 50 to 70-year-old stands that had never been commercially thinned. Four stand treatments of 30 to 60 acres were established at each study site: 1) unthinned control, 2) high density retention [120 TPA (trees per acre)], 3) moderate density retention (80 TPA), and 4) variable density retention (40 to 120 TPA). Small (¼- to 1-acre in size) leave islands were included in all treatments (except the control), and small patch cuts (¼- to 1-acre in size) were included in the moderate and variable density treatments.

Rethinning

The rethinning study was installed in four stands that previously had been commercial thinned (including Sand Creek in this project area, see Map 2). Each stand had two parts: one untreated control and the other a rethinning (30 to 60 TPA).

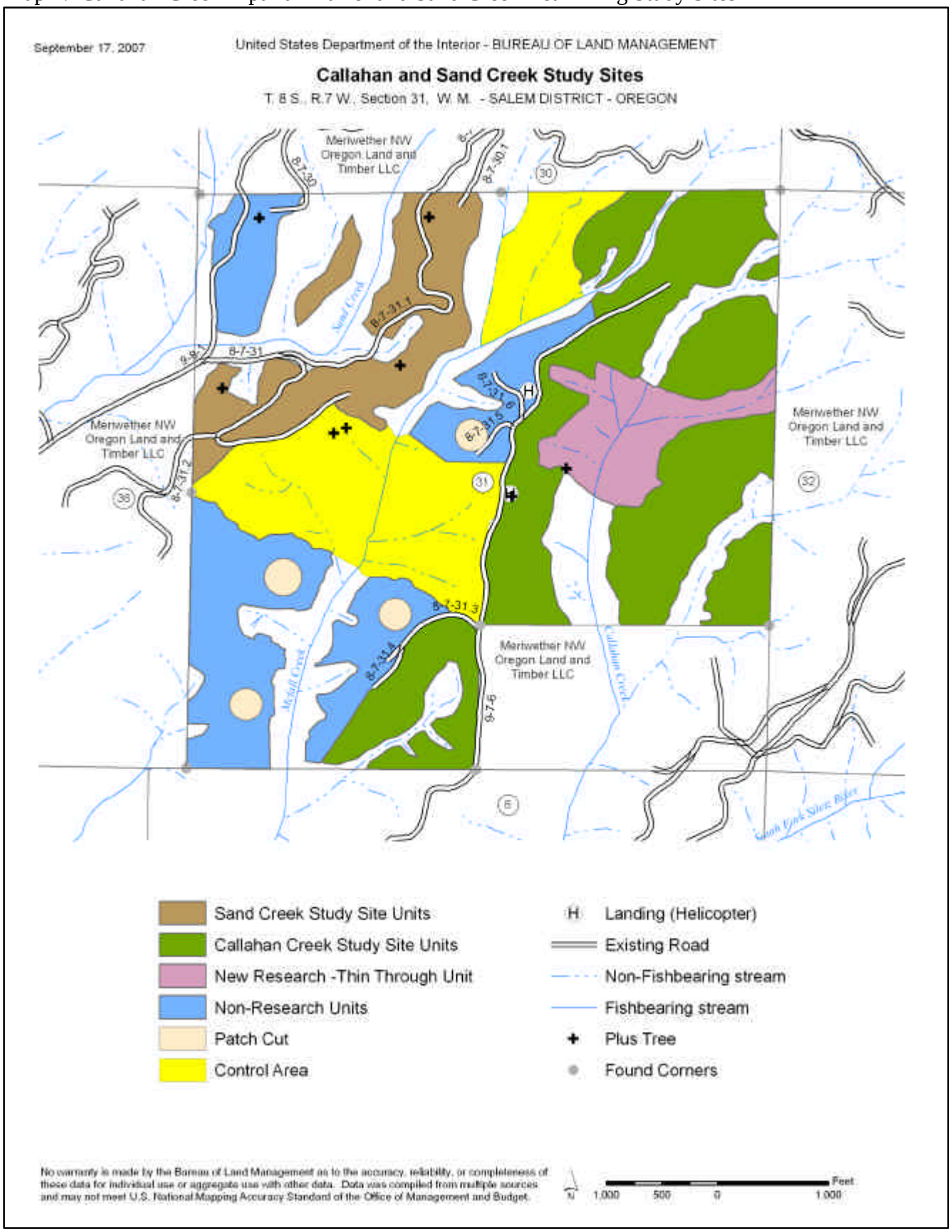
Riparian Buffer Study

The riparian buffer study (Callahan Creek, see Map 2) was integrated within the moderate density treatment (80 trees per acre) at each of the initial thinning study sites and two rethinning sites. Alternative SPZ widths included:

1) Streamside retention (one tree canopy width, or 20 to 25-foot; and retained all trees contributing to bank stability),
2) Variable width (follows topographic and vegetative breaks, with 50-foot slope distance minimum),
3) One full site-potential tree height (approximately 220-foot), and
4) Two full site-potential tree heights (approximately 440-foot).

A second round of density management manipulations are planned for implementation beginning in 2009. Tree densities would be reduced in each of the three studies; and along the stream reaches proposed for the 'thin-through' riparian treatment, Unit 31L (see Map 2).

Map 2: Callahan Creek Riparian Buffer and Sand Creek Rethinning Study Sites



2.2 Purpose of and Need for Action

The BLM proposes forest management activities on approximately 317 acres of 72 to 79-year-old stands. These activities may include timber harvest, road renovation, precommercial thinning, and coarse wood creation. The land use allocations for these activities are Adaptive Management Area and Riparian Reserves.

The following describe the purpose for the action:

Callahan Creek Riparian Buffer Study
Area was thinned to 80 trees per acre in 1997, planned for thinning to 30 trees per acre in this entry

- **Continue implementation of the Callahan Creek Riparian Buffer Study and Sand Creek Rethinning Study research projects that began under the original Callahan Creek Adaptive Management Project EA dated March 11, 1996, according to the specific implementation schedule set forth in IM OR-2005-83. The schedule for the next phase of these treatments would occur in 2009. Objectives of the study include:**
  - ✓ Evaluate effects of alternative forest density management treatments on important stand and habitat attributes;
  - ✓ Determine treatment effects on selected plant and animal taxa;
  - ✓ Assess the combined effects of density management and alternative SPZ widths on aquatic and riparian ecosystems;
  - ✓ Use DMS sites to develop operational approaches to implement new prescriptions and improve methods for effectiveness monitoring of plant and animal taxa;
  - ✓ Use DMS sites to share results of on-the-ground practices and findings with land managers, regulatory agencies, policy makers, and the public;
  - ✓ Use results from DMS research to conduct a long-term adaptive management process where management implications and policy changes are regularly evaluated and changed as needed.

- **Implement a subset of the specific management opportunities that were identified within the USWA and NCAMA consistent with AMA objectives (RMP p. 19) and standards and guidelines outlined above in Section 1.3, to:**
  - ✓ Restore and maintain late-successional forest conditions, which serve as habitat for late-successional forest species, which can be consistent with marbled murrelet guidelines;
  - ✓ Create terrestrial large down wood;
  - ✓ Provide a stable timber supply.

- **Manage mid-seral stands in RR LUA (RMP pp. 9-15) to:**
  - ✓ Accelerate growth of trees to restore large conifers to RR (RMP p. 7);
  - ✓ Enhance or restore habitat (e.g. CWD, snag habitat, instream large wood) for populations of native riparian-dependent plants, invertebrates, and vertebrate species(RMP p. 7);
  - ✓ Improve structural and spatial stand diversity on a site-specific and landscape level in the long-term (RMP pp. 11 and D-6).

- **Maintain and develop a safe, efficient and environmentally sound road system (RMP p. 62) to:**
  - ✓ Provide appropriate access for timber harvest and silvicultural practices used to meet the objectives above;
  - ✓ Provide for fire vehicle and other management access;
  - ✓ Reduce environmental effects associated with identified existing roads within the project area.

Marys Peak RA staff performed a comprehensive, landscape level analysis to determine relative priority of watershed areas within the RA for ecosystem management. Assessments of watershed, wildlife, silviculture, transportation, and ownership conditions were made in comparison with provincial strategies to identify opportunities, needs, and their relative urgency. The Upper Siletz River watershed emerged as one of the higher priority areas to perform density management of forest stands, improve late-successional habitat for marbled murrelet and northern spotted owl, and to improve the road system (APU, 2004).

The DMS sites are referenced in IM OR-2005-083, dated August 12, 2005, that directs the BLM Districts with established study sites to implement the next phase of the DMS at this time.

These forests typically have stands characterized by a single-layered, dense, overstory canopy with little to no large wood [greater than 24 inches DBHOB (diameter breast height outside bark)], live or dead, remaining from the primary growth stand. This area was salvage logged and cut over in the late 1920s through early 1980s. As a result, the structural characteristics of late-seral and old-growth forests, such as large snags, abundant down logs, and complex forest canopies are lacking across the landscape. In addition, the proposed forest management activities within the AMA and RR stands are needed to provide the gradual transition in structural characteristics that would 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) and to extend the persistence of hardwood tree and shrub cover diversity.

Existing roads within the project area need renovation work to assure all aspects of the roadway are functioning and in order to minimize impacts to the riparian zones and hydrologic flows. Renovation may include road and ditch blading for proper drainage, brush cutting for visibility and enhanced drainage, cleaning and replacing deteriorated or undersized culverts, and rock surface application to maintain water shedding capabilities during timber haul use.

There is a need to:

- Continue implementation of the research projects under certain guidelines such as using the same yarding methods in the study areas as in the past;
- Reduce stand densities using variable spacing methods;
- Create gaps and immediate terrestrial coarse woody debris;
- Renovate roads;
- Offer a timber sale that can be sold and implemented through the market place.

The harvest of research units (31C-31H, 31K, 31L and 31N) would be implemented within an 18-month period that would commence in October 2008. Operating period can only include the 2009 growing season to meet the timing objectives of the DMS. Harvest of non-research units (31A, 31I, 31J, and 31M) would be implemented within a three year period that would commence in October 2008.

2.3 Alternative Development

Pursuant to Section 102 (2) (E) of NEPA (National Environmental Policy Act 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 the Alternative 1 (No Action) and Alternative 2 (Proposed Action).

2.4 Alternative 1 (No Action)

The BLM would not implement any of the action alternatives at this time. This alternative serves to set the environmental baseline for comparing effects to the proposed action. Continued implementation of the DMS would not occur in Callahan and Sand Creeks.

2.5 Alternative 2 (Proposed Action)

This project consists of density management on approximately 317 acres of 72 to 79-year-old stands within AMA and RR LUAs. The stands would be thinned to target residual of 25 to 65 TPA. One objective of the proposed action is to implement a suite of treatments that were developed by scientists (the Density Management Studies) from OSU and the USDA Forest Service PNW, during consultation with BLM managers and resource specialists. Another objective is to implement density management in adjacent areas not part of the study (Units 31A, 31I, 31J and 31M), but designed to complement and contribute to an overall adaptive management demonstration area. This project incorporates "no-treatment/control areas" outside of the proposed sale area totaling above 10 percent, where either: (1) stand density and composition appear to be adequate, (2) where sensitive slopes or site conditions precluded treatment, or (3) are set aside as control areas for research. Both objectives would be met through a timber sale to be offered in 2008 (McFall Creek, Map 3). Trees would be skyline yarded on approximately 93 acres, ground-based yarded on approximately 6 acres and helicopter yarded on approximately 218 acres. Road renovation, CWD creation, creation of patch openings, and precommercial thinning are also a part of the Proposed Action.

2.5.1 Connected Actions

1. **Road Work**: Road renovation of approximately 6 miles would occur. Drain dips would be installed where cross drainage is necessary. Within existing roads spot rock application may

occur. Renovate two previously used helicopter landings (See Map 3). Install a silt fence on the haul route along North Fork Teal Creek in Township 8 South, Range 7 West, Section 26.

2. **Development of Existing Quarry:** To supply rock for the proposed project and future projects, an existing quarry will be utilized in Township 9 South, Range 7 West, Section 11 within LSR LUA (RMP p. 52). Activities would include excavating and removing rock materials for use on existing roads. Rock will be removed by ripping with a dozer. Existing quarry access roads will be opened for access to rock materials. Additional mining for future timber sales will be determined by utilizing existing development plans.
3. **Road Closure Agreement**: The area has a cooperative road closure in place for elk security/escapement with ODFW (Oregon Department of Fish and Wildlife) and adjacent landowners. Entry is by permit only.

2.5.2 Project Design Features

The following is a summary of the design features that reduce the risk of effects to the affected elements of the environment described in EA section 3.1.

General
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-10).

Table 2: Season of Operation/ Operating Conditions

Season of Operation or Operating Conditions	Applies to Operation	Objective
During periods of low precipitation, generally May 1 to October 31	Road Renovation	Minimize soil erosion
During periods of low soil moisture, generally June 15 to October 31	Ground-based yarding (Harvester/Forwarder and hydraulic loader)	Minimize soil erosion/compaction
During periods of low soil moisture, generally July 15 to October 15	Ground-based yarding (Tractor)	Minimize soil erosion/compaction
During periods of low tree sap flow, generally July 15 to April 15	Yarding outside of road right of ways (Skyline)	Protecting the bark and cambium of residual trees

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:

- ✓ Ground-based yarding with crawler tractors, hydraulic loaders, or harvester/forwarders would take place generally on slopes less than 35 percent. Logging debris would be placed in skid trails in front of equipment to minimize the need for machines to operate on bare soil.
- ✓ Harvester/forwarder use would require that logs be transported free of the ground. The equipment would be either rubber tired or track mounted, and have rear tires or tracks greater than 18 inches in width. Skid trails would be spaced approximately 60 feet apart and be less than 15 feet in width.
- ✓ Crawler tractor use would require the use of pre-designated skid trails spaced an average of 150 feet apart and be 10 feet or less in width. Use existing skid trails as much as practical.
- ✓ Hydraulic loader use would require utilization of pre-designated skid trails spaced at least 40 feet apart where they intersect boundaries and utilize existing skid trails as much as practical. Use of skid trails should be limited to one pass in and one pass out. Logging debris would be

placed in skid trails in front of equipment to minimize the need for machines to drive on bare soil.

- ✓ Following completion of ground-based yarding, skidding and harvest roads would be blocked where they are determined by the contract administrator to access main vehicular 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. Yarding corridors would average approximately 150 feet apart where they intersect boundaries and be 15 feet or less in width. Lateral yarding up to 75 feet from the skyline using an energized locking carriage would be required.
- ✓ Waterbars would be constructed where they are determined to be necessary by the contract administrator.
- ✓ Timber hauling would be permitted year round on rocked surfaces. During periods of rainfall when water is flowing off road surfaces, the contract administrator may restrict log hauling to minimize water quality impacts, and/or require the purchaser to install silt fences, bark bags, or apply additional road surface rock.
- ✓ All large areas of exposed mineral soil (roads to be renovated, cat/skid trails, landings), as determined by the contracting administrator would be grass seeded with Oregon Certified (blue tagged) red fescue (*Festuca rubra*), applied at a rate equal to 40 pounds per acre or sown/planted with other native species as approved by the resource area botanist. Prior to applying seed, the contractor would supply the BLM with the seed certification (blue tag) and seed label.
- ✓ Landings should be kept to the minimum size needed to accomplish the job and use existing road surfaces as much as possible.
- ✓ Helicopter yarding would be allowed year round, subject to soil conditions as determined by the contract administrator. Full suspension lift would be required.

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

- ✓ Stream protection zones (no cut buffers/no yarding areas) would be established along all streams and identified wet areas within the non-research harvest units (31A, 31I, 31J, and 31M) and the Rethinning Study unit (31C). These zones would be measured to the slope break, change in vegetation, or with a range of 50 to 60 feet from the channel edge (depending on percent slope) which ever is greater.
- ✓ Within the Riparian Buffer Study Units (31D-H, 31K, and 31N), SPZs would be applied at the same width as the initial harvest in 1997. The exception to this is the previous 440 feet SPZ would now have no SPZ ('thin-through' SPZ, Unit 31L) to facilitate additional research.
- ✓ To protect water quality, all trees within one tree height of all 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 except in helicopter units where full suspension lift can occur. No skyline or ground-based yarding would be permitted in or through SPZs.
- ✓ In unit 31L, when a cut tree falls within the stream bank (bankfull), the portion of the tree within the stream banks would remain in place.
- ✓ No openings larger than ¼-acre within 100 feet of streams would be allowed.
- ✓ No refueling would be allowed within 200 feet of any standing or running water (RMP, BMP pp. C-8 and C-6). Spill containment equipment would be kept on site.

To protect and enhance stand diversity and wildlife habitat components:

- ✓ Tree selection for removal would be based on Marking Guidelines (Appendix 2). Tree selection would be designed to leave a full range of diameter distribution, maintain or increase the proportion of minor species, and retain legacy and wildlife tree structure while meeting target densities. Residual tree densities range from 25 to 65 TPA.

- ✓ Thinning would occur primarily to Douglas-fir trees. Minor conifer species would be retained to maintain species diversity (except where they form dense patches, occur in yarding corridors, or skid trails). All hardwoods would be retained except where red alder would be thinned in the 'thin-through' unit, (Unit 31L), or occur in yarding corridors or skid trails.
- ✓ Any tree found to have a stick or ball nest, regardless of size would be left.
- ✓ Retain all plus trees (selected conifer for the genetics program) and Rethinning Study plot center trees (Unit 31C).
- ✓ All existing snags and CWD would be reserved. Additional trees would be reserved around snags to protect them from logging operations and reduce the likelihood of their removal for worker safety reasons. Any snags felled or logs moved for these purposes would remain on site as close to the origin area as possible within the project area.
- ✓ Understory conifers less than 7.0 inches DBHOB would be excluded from harvest.
- ✓ In Units 31A, 31C, 31D-H, 31K, 31N, understory trees that exceed a density of 80 TPA would be precommercial thinned. Monitoring immediately would determine timing of precommercial thinning occurring approximately 3 to 5 years post harvest. Thinning would emphasize removal of majority species and retention of minority species, and would generally be a thinning from below.
- ✓ At least 2 green trees per acre intended to be part of the residual stand would be felled to function as CWD at the completion of harvest operations. Trees to be utilized for CWD creation would be approximately the stand average diameter or larger. Incidentally felled trees or topped trees (i.e. tailtrees, intermediate supports, guyline anchors, hang-ups, etc.) that would be left by harvest operations would be counted toward this target, as well as existing class 1 and 2 logs (see Figure 1). If such incidentally felled trees are removed/sold, additional trees would be felled/girdled/topped to meet this target on a per treatment unit basis.
- ✓ New inputs of CWD would be achieved by: indirect harvest activities (e.g. breakage, limbs and tops, trees felled but not harvested), post-harvest wind throw, bark beetle kill in response to new accumulations of slash and wind throw, and post-harvest CWD creation. In Units 31C-31H, 31K, 31L and 31N, CWD creation would occur under the timber sale contract. In Units 31A, 31I, 31J, and 31M, CWD would be monitored 10 years post harvest and created if found deficient.
- ✓ Where possible trees would be cut and topped (for CWD and snags) adjacent to the largest live trees with the fullest crowns in order to maintain the existing complex structure of the full live crowns from natural pruning due to competition.
- ✓ In Units 31C-31H, 31K, 31L and 31N, snag levels would be monitored for 10 years post harvest to determine if levels are less than 5 large snags per acre. If found to be deficient at that time, snags would then be created as necessary to meet that level. Snag creation methods would include any or all viable and economically feasible methods to create full or partial snags from living trees
- ✓ Further enhancement and monitoring of CWD would occur within the proposed project as described in Table 7.
- ✓ Four patch cuts would be created in Units 31I, 31J, and 31M to create some early-seral gaps for wildlife use with relatively slow conifer regeneration periods, and compare understory development with areas of wide thinning. Unit 35M would have one 2-acre patch cut, Unit 31J would have one 1.5-acre patch cut and Unit 31I would have two patch cuts 1.5- and 2.0-acres in size.
- ✓ Within patch cuts, 4 green TPA would be retained for future downed wood (greater than 20-inch DBHOB and 120 lineal feet each), 5 green TPA above average DBHOB would be retained for future snag creation, and 3 to 4 TPA would be retained as live green trees. The very largest trees and those with wildlife habitat value (dead tops, defect, and forks) would be selected to leave. Leave trees could be scattered or grouped. Patch cuts would be allowed to regenerate naturally to conifer forest, rather than planting them. If post-treatment monitoring

determines that the green leave trees within the patch cuts are providing too much shade they would be cut or topped for snags and/or CWD.

To reduce fire hazard risk and protect air quality:

- ✓ Strategies would include directional falling (to keep slash away fuel breaks), followed by a reduction of surface fuels in order to reduce both the intensity and severity of potential wildfires in the long-term. Fuel reduction would be accomplished by burning of slash piles, by machine processing of slash on-site, or by a combination of these techniques.
- ✓ Light accumulations of debris cleared during renovation of roads that would remain in drivable condition following the completion of the project would be scattered along the length of rights-of-way.
- ✓ Heavy accumulations of debris on landings and within 30 feet of existing roads that would remain in drivable condition would be either machine or hand piled and burned as directed by the contract administrator.
- ✓ All piles would be located in locations suitable for burning at least ten feet away from reserve trees, snags, or unit boundaries. Piles should not be located on top of large logs or stumps. Larger piles would be preferable over small piles. Windrows would be avoided unless approved in advance by the contract administrator.
- ✓ The maximum width of the piles shall not be more than one and one half times the height. The piles shall be tight, free of earth, and free of projecting limbs or slash that would prevent adequate covering.
- ✓ In order to reduce the amount of material to be burned, material close to roads that is suitable for firewood should be set aside in accessible areas adjacent to the road and made available to the public. Wherever applicable and practical, logs larger than 12" in diameter shall be left scattered on site to help meet the down log requirement.
- ✓ During the late summer, before the onset of fall rains, all piles to be burned would be covered at least 80 percent with 4-millimeter (minimum thickness) black polyethylene plastic.
- ✓ The area would be monitored for the need of closing or restricting access during periods of high fire danger. During the closed fire season the first year following harvest activities, while fuels are in the "red needle" stage, the area may be posted and closed to all off road motor vehicle use. (See Road Closure Agreement in connected action above.)
- ✓ All burning would occur under favorable smoke dispersal conditions in the fall, in compliance with the Oregon Smoke Management Plan (RMP pp. 22, 65).

To protect Threatened and Endangered and Bureau Special Status Plants and Animals:

- ✓ Site management of any Federal or Oregon State Threatened and Endangered (T&E) or Bureau Special Status (SS) botanical and fungal species found as a result of additional inventories would be accomplished in accordance with, BLM Manual 6840- *Special Status Species Management* and the *Record of Decision, To Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines in Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (March 2004).
- ✓ The RA biologist and/or botanist would be notified if any T&E and Bureau SS plant and animal species were found occupying stands proposed for treatment during project activities. All of the known sites would be withdrawn from any timber harvesting activity within the non-research units. Units included in the research areas (31C-31H, 31K, 31L and 31N) would be exempt from NWFP and S&G (Standards and Guidelines) as stated in the REO (Regional Ecosystem Office) memo on Assessment and Review of Proposed Research under the Northwest Forest Plan, dated May 12, 2003 (Appendix 4).

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 were discovered during project work until an archaeologist can assess the significance of the discovery.

2.6 Alternatives Considered but not Analyzed in Detail

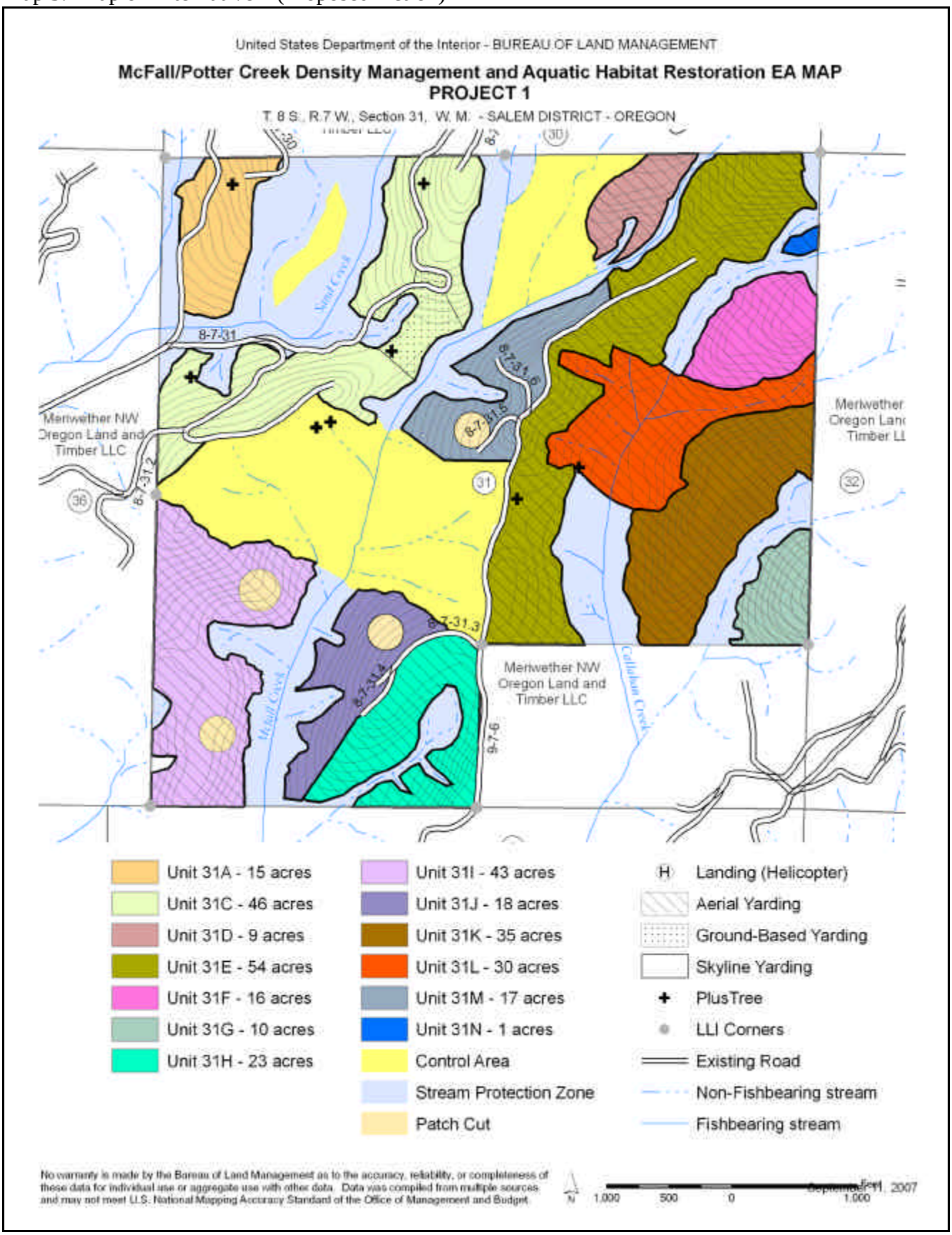
Inclusion of new road construction and additional density management area: An alternative that would have required an additional 3,100 feet of road construction as an alternative to helicopter yarding Unit 31I and skyline yarding an additional 4 acres through Sand Creek as part of the Rethinning Study was considered. The cost of the new road and the relatively small benefit of the density management (current TPA is on track for research) were determined not to be favorable. Subsequently, there was no further analysis of this alternative (see Map 4).

2.7 Project 1: Comparison of Alternatives With Regard To Purpose and Need

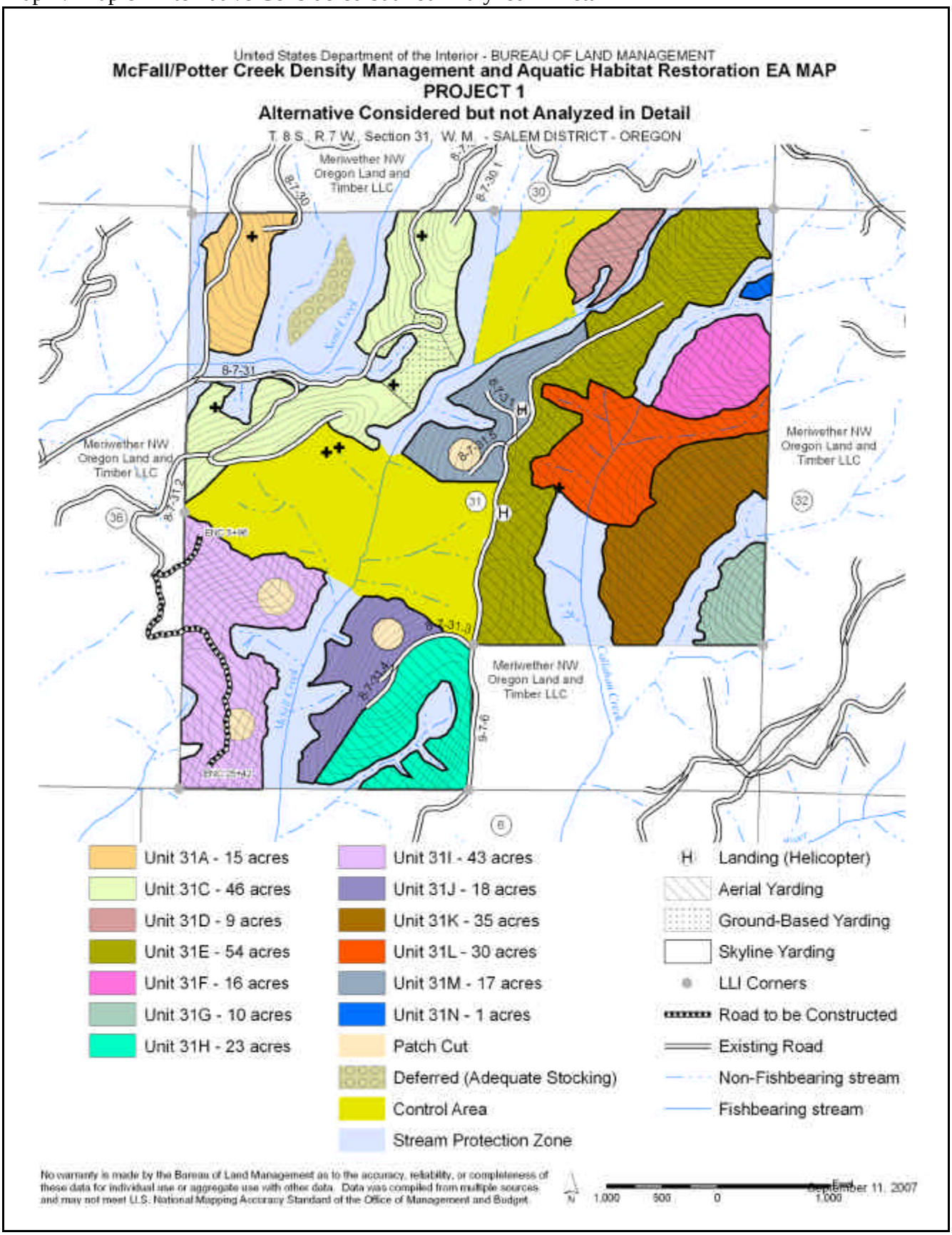
Table 3: Comparison of Alternatives by Purpose and Need

Purpose and Need (EA section 2.2)	Proposed Action	No Action
Continue implementation of the Callahan Creek Riparian Buffer Study and Sand Creek Rethinning Study research projects that began under the original Callahan Creek Adaptive Management Project EA dated March 11, 1996.	Continues the original purpose of the Density Management Study Plan with additional research and monitoring.	Does not meet this purpose and need. Research collected to date would have limited value without additional treatments and continued research.
Late-successional forest conditions, which serve as habitat for late-successional forest species, can be developed, accelerated, and enhanced (NCAMA, p. 2).	Creates patch openings with adjacent clumps of trees. Retains existing limbs on open grown trees through selective cutting of trees. Larger diameter trees felled for safety or operational reasons would be retained for CWD. Increases the quality and value of wildlife habitat.	Does not meet this purpose and need. Creates high level of small size CWD for the next decade or two in all stands within the project area.
Increase structural diversity in relatively uniform conifer stands.	Reduces tree densities within stands to increase diameter growth and more open stand conditions to preserve limbs and high crown ratios. Increases species diversity and understory regeneration, shrubs, forbs etc.	Does not meet purpose and need. Maintains a highly dense, uniform, small diameter stand of trees with receding crown ratios, loss of limbs, and loss of growth. Understory regeneration, shrubs etc. would be lacking.
Offer a marketable density management sale.	Offers approximately 9,380 MBF of timber for sale through 318 acres of density management.	Does not meet this purpose and need. No timber would be offered for dale.
Provides appropriate access for timber harvest and Silvicultural practices used to meet the objectives above, while minimizing increases in road densities.	Renovates approximately 6 miles of road.	No change. Maintain existing road densities in current maintained state.
	Would implement maintenance on feeder roads, allowing for continued access.	Delay maintenance on feeder roads, main routes would be maintained.

Map 3: Map of Alternative 2 (Proposed Action)



Map 4: Map of Alternative Considered but not Analyzed in Detail



3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS COMMON TO ALL 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 actions. 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 action alternatives, unless otherwise noted.

Table 4: "Critical Elements of the Human Environment" (BLM H-1790-1, Appendix 5) for All Projects

"Critical Elements Of The Human Environment"		Status: (i.e., Not Present , Not Affected, or Affected)	Do these projects contribute to cumulative effects? Yes/No	Remarks
Air Quality (Clean Air Act)		**Affected**	**Addressed in text EA section 6.2**	**Addressed in text (EA sections 3.2.6, 4.6.6, and McFall/Potter Fuels and Soils Report)**
ACEC (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 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 action would have no effect on energy development, production, supply, and/or distribution.
Environmental Justice (Executive Order 12898)		Not Affected	No	The proposed action is not anticipated to have disproportionately high and adverse human health or environmental effects on minority populations and 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**	**Addressed in text EA Section 6.1**	**Addressed in text (EA sections 3.2.1, 4.6.1, 5.6.1, and McFall/Potter Botanical Report)**
Native American Religious Concerns		Not Affected	No	No Native American religious concerns were identified during the public scoping period.
Threatened or Endangered (T/E) Species or Habitat	**Fish**	**Affected**	**Addressed in text EA Section 6.4**	**Addressed in text (EA section 3.2.4, 4.6.4, 5.6.4, and McFall/Potter Fisheries Report)**
	Plant	Not Present	No	

"Critical Elements Of The Human Environment"		Status: (i.e., Not Present , Not Affected, or Affected)	Do these projects contribute to cumulative effects? Yes/No	Remarks
	Wildlife	**Affected**	**Addressed in text EA Section 6.5**	**Addressed in text (EA sections 3.2.5, 4.6.5, 5.6.5, and McFall/Potter Biological Evaluation Report)**
Water Quality (Surface and Ground)		**Affected**	**Addressed in text EA section 6.3**	**Addressed in text (EA Sections 3.23, 4.6.3, 5.6.3, and McFall/Potter Hydrology Report)**
Wetlands (Executive Order 11990)		Not Present	No	Wetlands would be designated as SPZs and buffered out of treatment areas.
Wild and Scenic Rivers		Not Present	No	
Wilderness		Not Present	No	

Table 5: Other Elements of the Environment for All 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
Fire Hazard/Risk		**Affected**	**Addressed in text EA section 6.2**	**Addressed in text (EA sections 3.2.6, 4.6.6, 5.6.2, and McFall/Potter Fuels and Soils Report)**
Other Fish Species with Bureau Status and Essential Fish Habitat		**Affected**	**Addressed in text EA section 6.4**	**Addressed in text (EA sections 3.2.4, 4.6.4, 5.6.4, and McFall/Potter Fisheries Report)**
Land Uses (right-of-ways, permits, etc)		Not Affected	No	Agreements are in place and would not be changed by the proposed project.
Late-Successional and Old-Growth Habitat		Not Present	No	
Mineral Resources		Not Present	No	
Recreation		Not Affected	No	Dispersed recreation in the area may include hunting, camping and target shooting and would continue upon completion of the proposed projects therefore recreational activities would not be affected
Rural Interface Areas		Not Present	No	
Soils		**Affected**	**Addressed in text EA section 6.2**	**Addressed in text (EA sections 3.2.2, 4.6.2, 5.6.2, and McFall/Potter Fuels and Soils Report)**
Special Areas outside ACECs (Within or Adjacent) (RMP pp. 33-35)		Not Present	No	
Other Special Status Species/Habitat	**Plants**	**Affected**	**Addressed in text EA section 6.1**	**Addressed in text (EA sections 3.2.1, 4.6.1, 5.6.1, and McFall/Potter Botanical Report)**
	Wildlife	**Affected**	**Addressed in text EA section 6.5**	**Addressed in text (EA sections 3.2.5, 4.6.5, 5.6.5, and McFall/Potter Biological Evaluation Report)**
Visual Resources		**Affected**	**No**	**The projects are located within VRM Class 3 and 4 designations. Changes to the landscape character are expected to comply with these guidelines.**

Other Elements of the Environment	Status: (i.e., Not Present , Not Affected, or Affected)	Do these projects contribute to cumulative effects? Yes/No	Remarks
Water Resources – Other [303d listed streams, DEQ (Department of Environmental Quality) 319 assessment, Downstream Beneficial Uses; water quantity, Key watershed, Municipal and Domestic]	**Affected**	**Addressed in text EA section 6.3**	**Addressed in text (EA sections 3.2.3, 4.6.3, 5.6.3, and McFall/Potter Hydrology Report)**
Wildlife Structural or Habitat Components - Other (Snags/Coarse Woody Debris/ Special Habitats, road densities)	**Affected**	**Addressed in text EA section 6.5**	**Addressed in text (EA sections 3.2.5, 4.6.5, 5.6.5, and McFall/Potter Biological Evaluation Report)**

3.2 Affected Environment and Environmental Effects

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

3.2.1 Vegetation

(IDT Reports incorporated by reference: Silviculture Prescription McFall Creek Project, pp. 1-37, Botanical Report McFall/Potter Creek Density Management Project, pp. 1-15)

Affected Environment

Site Conditions

The McFall project is located in the Northern Oregon Coast Range at elevations ranging from 1,200 to 1,600 feet. The slope ranges from 0 to 70 percent with various aspects throughout the proposed project area. The climate is influence by the Pacific Ocean, with cool wet winters and warm dry summers. Average annual precipitation is approximately 100 to 120 inches, most of that falling from November through March. Snowfall is uncommon, and most winter days are frost-free. Severe winds ranging from 70 to 100 plus miles per hour and most often associated with low pressure fronts occur infrequently during fall and winter.

The major plant grouping as listed in the Salem District Proposed Resource Management Plan/Final Environmental Impact Statement (V.1, chapter 3, pp. 29-32) is the Douglas-fir/Red Alder/Salmonberry grouping which occurs on the west slopes of the Oregon Coastal Mountains.

Present Stand Condition and History

The stands range from 72 to 79 years old, and are predominantly Douglas-fir with minor components of western hemlock and red alder. They originated from natural regeneration in the late 1920's after clearcut harvest. Management did not occur until 1975, when about 100 acres (Units 31A and 31C) were commercially thinned to 115 TPA. Approximately 231 acres (or 73 percent) of the project area is within RR boundaries. However, the habitat conditions of the uplands are essentially identical to habitat conditions within the RR boundaries for these treatment units.

Eighty-six acres of the area thinned in 1975 was then rethinned in 1996 to 45 residual TPA in the "Rethinning Study" component of the Density Management and Riparian Buffer Study. In 1996, 151 acres in Callahan and McFall creeks were initially thinned to approximately 80 residual TPA, (Riparian Buffer Study).

The areas thinned in 1975 and 'rethinned' in 1996 have 370 to 1,100 saplings per acre in the understory, and areas initially thinned in 1996 have about 175 saplings per acre.

Table 6: Current Stand Conditions and Recommended Treatments (trees greater than 5" DBHOB)

Unit	Age[1] (yrs)	Pre-treatment stand characteristics					Recommended post-treatment stand characteristics immediately after thinning				
		TPA[2]	BA[3] (sq ft)	QMD (in)[4]	RDI[5]	CR[6]	TPA[2]	BA[3] (sq ft)	QMD (in)[4]	RDI[5]	CR[6]
31A	71	47	142	23.5	.39	0.71	25	80	23.8	0.33	.72
31C	78	45	157	25.3	.61	0.77	35	126.4	25.7	0.53	.77
31M	79	122	276	20.4	.73	0.45	65	196.9	24.1	0.55	.55
31D, 31E, 31F, 31G, 31H, 31K, 31N	79	80	239	23.5	.63	0.60	35	121.5	24.5	0.41	.66
31L	79	130	303	20.6	.61	0.37	65	194	22.9	0.52	.40
31I, 31J	71	76	275	25.8	.66	0.47	35	176.1	29.9	0.45	.58

1: Total stand age - 2005 data.
2: Number of trees per acre.
3: Basal area per acre.
4: Quadratic mean diameter, diameter at breast height (4.5 feet) of tree of average basal area.
5: Proportion 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.
6: Crown ratio is the amount of live crown in relation to total tree height. Greater crown ratio generally indicates greater tree health and vigor. (Average crown ratio is much less than those of dominant trees.)

Stand Structure and Forest Health

These stands are currently in the stem exclusion stage of development (Oliver and Larson, 1996), typified by strong inter-tree competition. Under such competition, crowns recede from below due to shading, stems become taller and slender as height growth continues but diameter growth slows in response to the loss of crown. Trees become less stable and more susceptible to pests. Death occurs from suppression where stands are differentiating, from insects and diseases where trees are weakening, and/or from buckling where tree stems become very tall and thin (Oliver and Larson, 1996).

Coarse Woody Debris

The proposed treatment areas have widely scattered large snags and well distributed accumulations of large CWD. Stem exclusion processes have also created moderate level of small diameter snags and down logs, and a few small root-rot pockets scattered throughout.

The majority of the CWD is in the 'soft' decay classes (Figure 1) and appears to be cull logs felled in past harvest. More recent down wood input is from trees that have died from suppression, wind, or disease.

The range in the number of snags per acre in the McFall Creek project area is from 2.7 to 20.3, an average of 10 conifer snags per acre. The average DBHOB ranges from 17 to 33 inches within each unit and overall averages about 22 inches DBHOB. Approximately 47 percent of the snag volume is in decay classes 1 and 2 and many appear to be smaller sized Douglas-fir trees that have died as a result of suppression. In addition, there is an average of about 0.5 broken-topped trees per acre.

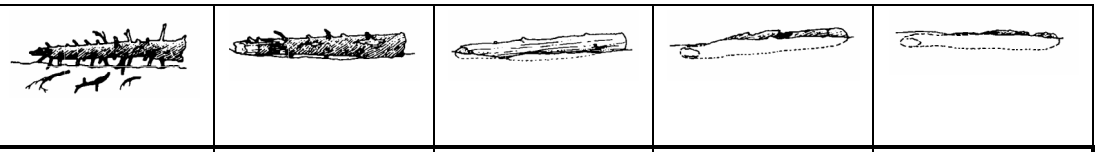
Table 7: CWD prescription within the McFall Creek Density Management

Part A. Current CWD conditions[1]						
Unit	CWD Volume[2]		Snags per Acre by Size Class[3]			
	CF/acre	% DC1+2	7-10"	11-19"	20"+	Total
31A	3264	11	0	1.1	1.5	2.6
31C	783	63	2.9	3.8	1.2	7.9
31D-31H, 31K, 31L, 31N	2242	28	1.6	4.1	2.3	8.0
31M	1240	34	7.9	6.6	2.1	16.6
31L	2242	28	0	9.3	3.3	12.6
31I, 31J	1778	13	0	9.3	3.3	12.6

Part B. Proposed CWD Prescriptions			
Proposed Unit	Prescription Objective[4]	Desired Input[5]	
		Snags	Down Logs
31C, 31D-31H, 31K, 31L, 31N	Create consistent CWD levels for research design and wildlife habitat objectives.	5	2
31A, 31M, 31I, 31J	Meet RMP objectives for CWD levels in mid-late seral stands.	5	2

1) CWD data comes from stand exam surveys where down logs were counted along transects and the number of standing snags were counted at fixed plots.
2) Down log volume is reported in cubic-feet per acre and the percent of that volume that exists in hard decay classes (decay class 1 and 2).
3) Snags are reported in size classes based on DBHOB.
4) The general goal is to balance both long-term and short-term needs for CWD by adding some new material now and to let residual trees grow larger for future CWD recruitment.
5) Desired Input is expressed as trees per acre created in the units. Harvest activities (intermediate supports, stand damage, limbs and tops, felled but retained logs) and post-harvest processes (wind throw, bug kill, etc.) would be evaluated within 10 years of harvest action and these inputs would be considered prior to creating additional snags.

Figure 1: Down Tree and Down Woody Material Decay Class Condition Codes



Log Decomposition 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

Threatened/Endangered and Special Status Botanical and Fungal Species
Inventory of the project area for federal and Oregon State T&E and Bureau SS vascular plant, lichen, bryophyte, and fungal species were accomplished through intuitive controlled surveys, in accordance with survey protocols for the specific groups of species.

There are no known sites of any T&E or Bureau SS vascular plant, lichen, bryophyte or fungi species within the proposed project area; nor were any found during subsequent surveys.

Invasive/Non-Native Plant Species (including Noxious Weeds)
The following noxious weeds are known to occur within or adjacent to the project area, Tansy ragwort (*Senecio jacobaea*), bull and Canadian thistles (*Cirsium vulgare* and *C. arvense*), St. John's wort (*Hypericum perforatum*), and Scot's broom (*Cytisus scoparius*).

Environmental Effects

3.2.1.1 Alternative 1 (No Action)

Natural disturbance agents such as disease, insects, and wind would create stand structural diversity. 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 treatment were implemented.

Stand Structure
Stand structural conditions would remain on the current trajectory of high and increasingly high densities. Understory development would be limited as few new understory trees would become established, and existing understory trees would die or slow in growth due to increasing competition. According to the stand growth projections (ORGANON growth and yield computer simulation model, Edition 7.0 Hann, 2003) for the next 30 years, the relative density would continue to increase from a current average of 0.68 to 0.85 in 30 years without treatment, indicating very dense stand conditions. Unit 31C (rethinned in 1996) however, is at a lower density and would not grow into the 'zone of imminent mortality' for almost three decades.

Crown ratios would decrease as the canopy closes, from the current average of 56 percent to 37 percent in 30 years. Wind firmness and individual tree stability would also decrease. The canopy in the previously unthinned stands would remain closed for several decades and the canopy in the previously thinned stands would continue to close. The number and diversity of understory and shrubs/forbs species in many areas may remain low. Eventually, dominant trees would shade out and kill suppressed and co-dominant trees. This would create additional snags and CWD.

Currently height to diameter ratios of the McFall Creek stands is 73, ranging from 51 to 93. The ratio is a measure of tree stability, the taller and thinner the tree, the less stable. Values of 80 or less are considered fairly stable, the lower the number the more stable. Without thinning the height to diameter ratio would continue to climb and trees would become less stable.

There would be no reduction in canopy density and consequently no microclimatic changes in the RR.

Forest Health
Disturbance events and endemic levels of insects and disease would not be expected to result in accelerated stand development with any degree of certainty. The main input of CWD would come from such events, and from density mortality. Without treatment, density mortality would continue and increase. However, mortality would be very limited in the next few decades (within stands that were thinned in 1996). Inputs from disease and wind throw would continue, and events may result in more numerous snags or downed logs due to higher stand density. In general, the quantity of trees dying is expected to be greater than in treated areas, but smaller sized.

There would be no short-term elevated risk of bark beetle infestation resulting from harvest and CWD creation, but greater risk of significant wind throw that could trigger bark beetle infestation would exist. Blowdown trees may occur in winter storms creating additional habitat for the Douglas-fir bark beetle. As openings in the canopy are created, (blowdown, dying trees from pathogens, and insects) additional sunlight would be available to the understory, shrubs and forbs. Openings may increase the number and diversity of "botanical and fungal" species in the area. Open slash covered areas may become dominated by shrubs (salal) and/or ferns.

Threatened/Endangered and Special Status Botanical and Fungal Species
Not affected, since no known sites exist within the project area.

Invasive/Non-Native Plant Species (including Noxious Weeds)
Without any new human caused disturbances in the proposed project area the established noxious weed populations would remain low.

3.2.1.2 Alternative 2 (Proposed Action)

All existing vegetation that occurs where roads would be renovated would be scraped to mineral soil and a road maintained. Timber falling, yarding operations and road renovation would disrupt the soil organic layer and expose mineral soil, especially in yarding corridors.

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. However, thinning short-circuits the snag recruitment that results from inter-tree competition (Carey, 1999).

Thinning to the recommended densities is expected to put the stands on a trajectory toward development of some late-seral forest conditions.

Stand Development
The proposed action would remove suppressed and co-dominant coniferous trees. This action would allow the reserved conifers to increase in size (height and width) at a faster rate versus the No Action alternative. The more open canopy resulting from thinning would allow for an increased amount of sunlight to reach the understory and forest floor species (conifer and hardwood seedlings and saplings, shrubs, forbs, ferns and grasses and sedges) and cause ground level microclimatic changes such as increased maximum temperatures, lower minimum humidity, and increased wind speed. The increase in sunlight may allow these species to increase in size and density. Openings could become dominated by shrub and/or fern species. The tree growth would result in recovery of canopy by as much as 4 to 6 percent annually. Understory establishment would begin to contribute significantly to canopy cover as well. These effects adjacent to streams would be reduced by SPZs and would be the subject of research under the Riparian Buffer Study units.

On the average, the recommended levels of thinning would increase both understory and overstory tree diameter growth, increase crown length, width, and branch size, promote stand stability (indicated by the height:diameter ratio), and result in a greater level of understory development than would occur without thinning. Crown ratios of untreated stands fall to 0.37 within 30 years, but stay at 0.45 in treated stands. Thinning would primarily reduce the Douglas-fir component, increasing the relative proportion of the other tree species. In the long-term (greater than 30 years), the larger-sized trees would result in higher quality down logs and snags as the trees eventually die, blowdown or are converted to snags or down logs through planned management actions.

The predicted average increase in QMD for overstory trees as a result of density management thinning for all units averages 6.8 inches, from a current unit average of 25.2 inches immediately following treatment, to an average of 32 inches after 30 years of growth. Without thinning, the average increase in QMD is predicted to be 5.8 inches. Density management would result in an additional 1-inch of diameter growth in 30 years, a 20 percent increase from no treatment.

Coarse Woody Debris Management
Proposed treatments to create downed logs and snags would increase the number of snags per acre by 50 percent on average, and created snags would average about 30 inches in DBHOB, much larger than existing snags. Downed log volumes would increase by 20 to 40 percent. Inputs would be of decay class 1 material that is currently very limited.

Forest Health
The stems of the severed conifers would be removed from the project area while their tree tops, branches, and broken/shattered stems would remain on site to decay. Some of the broken stems and larger diameter tops would provide short-term habitat for the Douglas-fir bark beetle. In the unlikely event of a large infestation of these beetles, some reserved Douglas-fir trees may be killed in the following 1 to 5 years. Subsequent infestations are not likely after approximately 5 years. The newly thinned conifer stands may become susceptible to blow down by high winds. This would create additional CWD within the stands. Blown down timber may also lead to an increase in the Douglas-fir bark beetle populations.

Falling trees for CWD would increase the risk of Douglas-fir beetle caused mortality of residual standing trees, depending on the number of felled trees per acre (Hostetler and Ross 1996).

Studies of Oregon Coast Range sites where 20 large TPA were felled for CWD showed an average of one green tree per acre killed in the following 3 years (Ross, et al, 2006), so felling 2 trees per acre represents a low risk.

The potential for wind throw from winter storms would be higher for the first decade following density management. Trees in stands thinned in 1996 (Callahan Creek Riparian Buffer Study) are now more wind-firm and residual trees are less likely to blow down after this second thinning. The relatively greatest risks of wind throw are in those stands that are dense and have not been previously thinned (Units 31L and 31M). Risk is also greater near created openings (proposed patch cuts and clearcuts on adjacent private lands) and where aspect and topography increase windthrow risk. Windthrow is not expected to reduce tree stocking by more than 20 percent overall.

Damage to Residual Trees
Skyline, ground-based and helicopter yarding systems would result in some minor damage to 1 to 5 percent of the residual trees. Helicopter logging may cause some delimbing or "pruning" of residual trees as the logs are lifted through the canopy. In areas proposed for skyline logging, yarding corridors (12 to 15 feet wide) could comprise approximately 10 percent of loss of the residual trees. It would likely be lower due to relatively wide thinning, existing yarding corridors from past harvest, and the tendency of the logger to select gaps for corridor placement.

Pile Burning
Prescribed burning of slash piles along roads and on landings could result in damage to the crowns of residual trees. To the extent that yarding systems or prescribed burning results in tree death, such small impacts to the residual stand would be consistent with CWD inputs proposed for the units.

Effects from Patch Cuts
Patch cuts would result in early-seral habitat, intended to be of high quality (featuring abundant CWD, snags, flowering and fruiting vegetation and a few residual overstory trees) that provides important habitat for many species including Roosevelt elk. The patch cuts are very likely to reforest naturally and grow back into closed forest over a decade or more. If objectives change at any time in the future, site preparation and planting could be implemented.

Effects on the Attainment of Aquatic Conservation Strategy Objectives from density management within the Riparian Reserves
Desirable habitat for aquatic and riparian dependant species would be enhanced by maintenance of stand health and stability, long-term increase in quality LWD recruitment, and maintenance of stream temperature through shading.

Stream shading would not be affected by the proposed density treatments in areas where SPZ widths are greater than 50 feet. Additionally, topographic shading occurs on many of the small streams where the draws have steep side slopes.

Habitat to support well distributed riparian dependent and riparian associated species would be maintained by the density management. Such treatments would result in forest stands that exhibit older forest characteristics such as large diameter trees with deep wide crowns and large limbs, complex understory with vegetation developing at mid-canopy and ground levels, and large diameter snags and CWD. Such a habitat would support diverse populations of plants, invertebrates, and vertebrates. As these treated stands age, secondary structural characteristics (i.e., large dominant trees) are likely to develop sooner than if no treatments were performed.

Threatened/Endangered and Special Status Botanical and Fungal Species
This project would not directly affect any T&E or Bureau SS vascular plant, lichen, bryophyte, or fungi species since there are no known sites within the project area.

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

Invasive/Non-Native Plant Species (including Noxious Weeds)
Any ground disturbing activity may lead to an increase in noxious weeds known from within the project area. All road renovation, timber falling and yarding operations may disrupt areas of organic material and expose mineral soil. Non-native species may become established in any exposed mineral soil areas. In western Oregon, many non-native species often persist for several years but soon decline as native vegetation increases within the project areas. However, some species can persist for long periods.

This project would comply with the Marys Peak Integrated Non-Native Plant Management Plan. The risk rating for the long-term establishment of noxious weed species and consequences of adverse effects on this project area is low. Adverse effects from noxious weeds within the project area are not anticipated for the following reasons: The project design feature of reestablishing vegetation on exposed soil areas by sowing with Oregon Certified (blue tagged) red fescue (*Festuca rubra*) applied at a rate equal to 40 pounds per acre or sowing/planting with other native species as approved by the resource area botanists is expected to minimize the establishment of noxious weeds.

3.2.2 Soils

(IDT Reports incorporated by reference: McFall/Potter Creek Density Management Fuels and Soils Report, pp. 1-22)

Affected Environment

The predominant soils in the project area are Bohannon gravelly loam and Astoria clay loam. Less predominant soils found in the area are Valsetz and Brenner series. Valsetz soil is found around some of the ridges in the project area. Brenner soils are found in the lower gradient, poorly drained flood plains. These soils are silt loam in texture and found on slopes of 3 percent or less.

The major management concern with the Bohannon, Astoria, and Valsetz soils is the sensitivity to compaction when moist or wet and the subsequent reduction in infiltration rate. On sites greater than 25 percent, run off rates and erosion hazards can be high for bare soil. The areas of Brenner soil is all within riparian areas and for the most part would not support conifer tree growth due to the high water tables. Disturbance of areas with Brenner soils would not be expected to substantially affect long-term productivity of the site, but may lead to some short-term effects to vegetation composition and/or water quality.

Environmental Effects

3.2.2.1 Alternative 1 (No Action)

This alternative would result in no change to the affected environment. Short-term impacts to soils would be avoided.

3.2.2.2 Alternative 2 (Proposed Action)

Compaction and disturbance/displacement of soil
Following completion of this proposed action, the majority of the vegetation and root systems would remain, along with surface soil litter and slash from thinned trees. Expected additional amounts of surface soil displacement, surface erosion, and dry ravel resulting from commercial thinning operations should be minimal. Some additional soil compaction can be expected to result from this project, but the aerial extent and degree would remain well below the established district guidelines (10 percent or less).

Landings
Some additional ground adjacent to the road surface is 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 is 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. However, most of this would occur on existing road surfaces.

The estimated number of landing sites needed for skyline yarding is 31. About half of the surface area used for landings is existing road surface. The additional area adjacent to the road that is needed for landing area is estimated to be approximately 800 square foot per landing. For the entire proposed project area, this amounts to 0.6 acres.

The two existing landings proposed for use by helicopter yarding would not be increased in size so no additional impacts would occur to these two sites.

Yarding
No negative effects on soils are expected from helicopter yarding since logs are lifted free of the ground for transport to the landing.

Skyline yarding corridors, (area affected about 3 percent of the skyline area or approximately 2.8 acres); impacts usually result in light compaction of a narrow strip less than 4-foot wide. No measurable long-term effects on site productivity are expected from this type and amount of disturbance.

For ground-based yarding, impacts would vary depending on how dry the soils are when heavy equipment operates on them and how deeply covered with slash the soils in the skid trails are. In tractor skid trails, expect a moderate amount of top soil displacement and moderate to heavy soil compaction to occur depending on the amount of use. For the entire ground-based area (6 acres), the percentage of total area impacted by surface disturbance and soil compaction would be 6 to 9 percent (approximately 0.4 to 0.6 acre). Expect a moderate to heavy degree of soil compaction and a moderate amount of top soil displacement to occur in skid trails and at landings.

The total (new and existing) area of impacted ground from all yarding activity under this project proposal is expected to be well below the 10 percent district guideline for aerial extent of soil impacts listed in the Salem District RMP.

Site Productivity
The estimated reduction in growth rate for trees on moderate to severely impacted areas is 15 to 30 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 yarding corridors, skid trails, and small landings. If top soil loss/displacement/compaction were severe or more broadly based in aerial extent, then the negative effects would be more pronounced and longer lasting.

Pile Burning: Observations over 3 decades of burning piled slash in this area of the Oregon Coast Range has shown no reduction in site productivity and in some cases an increase in tree growth on areas where piled slash has been burned. Based on this local experience, no reduction in site productivity is expected from this proposed activity.

Skyline Yarding: For skyline yarding systems, soil impacts in yarding corridors are expected to result in light compaction in narrow strips less than 4 feet wide. The affect on overall site productivity from light compaction on less than 1 percent of the total area is expected to be none or very low (no measurable reduction in overall yield for the project area).

Ground-Based Yarding: For tractor yarding plus all landings (approximately 4.2 acres), the worst case expected reduction in productivity is a 10 to 20 percent reduction in yield on those 4.2 acres of landings and skid trails. The affect on overall project site productivity resulting from the impacted acres is expected to be less than 0.3 percent reduction in overall yield for the 317-acre project area. It should be noted that 3 of the 4.2 impacted acres are pre-existing landings so newly impacted acres for ground-based yarding and landings is actually 1.2 acres.

In order to avoid damage to existing tree roots, we would not plan to rip skid trails to mitigate compaction. Mitigation would only be in the form of limiting soil disturbance and compaction by yarding on top of slash as much as possible and doing ground-based yarding during periods of low soil moisture with a minimum of skid trails.

For helicopter yarding systems, no measurable reduction in overall yield for the project area is expected.

Effects on Soil Erosion

Experience over 3 decades of burning piled slash in this area of the Oregon Coast Range has resulted in no evidence of surface erosion from areas where piled slash has been burned. Based on this local experience, no increase in surface erosion is expected from this proposed activity.

With slash and existing undergrowth being left on nearly all of the area, no measurable amounts of surface erosion are expected from the forested lands treated under this proposed alternative.

Waterbarring and blocking skid trails would promote out-slope drainage and prevent water from accumulating in large volumes that could cause erosion that could reach streams. A small amount of localized erosion can be expected on some of the skid trails the first year or two following yarding. Any eroded soil is not expected to move very far from its source and would be diverted by the waterbars or out sloping and would spread out in the vegetated areas adjacent to the trails and infiltrate into the ground. After several seasons, the accumulated litter fall on the skid trails would reduce the impact of rainfall on the soil surface further reducing the potential for erosion of the skid trails.

3.2.3 Water

(IDT Reports incorporated by reference: McFall/Potter Creek Density Management Hydrology Report, pp. 1-20 & Cumulative Effects Analysis for the McFall/Potter Creek Thinning, pp. 1-6)

Affected Environment

Climate and Hydrology

The annual average precipitation measured near the project area is 120 inches; at other points in the watershed, measurements were up to 175 inches per year (USDI, 1996). Winters are cool and wet and summers are warm and dry. Most precipitation occurs between November and March. At high elevations, precipitation intensities can be expected to exceed 5 inches in 24 hours every two years (USDI, 1996). Elevations above 2,300 feet are subject to ROS (rain on snow) events, which can cause large flood events. The headwaters of the perennial fish-bearing streams are along the steep southern slopes of Fanno Ridge. These drainages begin within the TSZ (transient snow zone); although none of the project area is within the TSZ.

Project Area Streams

The lower slopes of Fanno Ridge are a large slump block of mixed sediments. Streams are actively down cutting through these deposits leading to incised streams and high sediment load (USDI 1996). Many stream channels in the project area are very small intermittent and perennial first and second order headwater tributaries. The larger streams in the area are tributaries to the South Fork Siletz River. These larger streams are high gradient (above 12 percent) transport reaches in the northern part of the project area but are lower gradient (2 percent) response reaches in the southern part (USDI 1996). The riparian areas are well vegetated and streams are considered low risk for high temperatures.

Project Area Water Quality

Fine Sediment and Turbidity

The South Fork Siletz River has a naturally high sediment load (USDI 1996). During 2007 summer 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. No quantitative turbidity data was located for this analysis.

Stream Temperature

Stream reaches in the project area were identified as having a “low” risk of temperature increases due to inadequate shading (USWA, 1996). Most stream channels in the field appear well shaded by conifers and Red alder. Stream temperature data is being collected as part of the DMS.

Oregon Department of Environmental Quality (DEQ) Standards

None of the project area streams or immediate receiving bodies are listed for water quality concerns on the State of Oregon 303d list of impaired water bodies. The Siletz River, (approximately 7.5 miles downstream of the project area) is listed for high summer temperatures. Summer stream temperatures collected by the BLM in 1994 exceeded state standards for 33 out of 39 days from July to early August (USDI 1996).

Beneficial Uses

The drinking water for the City of Siletz is supplied by intakes on the Siletz River over 30 miles downstream of the proposed project. There are two water rights in the South Fork Siletz

subwatershed: Boise Cascade Corporation (1955, 0.01 cfs (cubic feet per second)) on Fanno Creek and AJ Parrish (1930, 0.05 cfs) on Sand Creek (USDI 1996). These are likely to be no longer active.

Additional recognized beneficial uses of stream flow in the project area include anadromous fish, resident fish, recreation, and esthetic value. Best management practices would be implemented to help eliminate and/or minimize any potential impacts to beneficial uses of the project watersheds. This project is not in a key watershed.

Environmental Effects

3.2.3.1 Alternative 1 (No Action)

The No Action alternative would result in a continuation of the condition and trends as described in the USWA and the Affected Environment. No additional disturbance to flow paths resulting from yarding and road work/use would occur. Streams disturbed from past management would continue to evolve towards a stable condition. Without thinning, the trees available for large wood in the streams would not reach as large a diameter as quickly as trees in areas that are thinned.

3.2.3.2 Alternative 2 (Proposed Action)

Stream Flow

In almost all cases, removal of more than 20 percent of the vegetative cover over an entire watershed would result in increases in mean annual water yield. Removal of less than 20 percent of vegetative cover has resulted in negligible changes, within natural variability of the system (Bosch 1982).

The proposed project would treat 317 acres (less than 9 percent of the forest cover) of the 3,551-acre Headwaters of the South Fork Siletz River seventh-field watershed. As this is a thinning, in reality less than half the trees would be removed in most of the project area (except for the 7 acres of patch cuts). 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. None of the project area lies within the ROS zone, so elevated risk of peak flows from ROS events is unlikely.

Of the 317 acres to be thinned, 221 acres (70 percent) would be helicopter yarded. This method causes minimal ground disturbance and would not affect flow paths or timing of peak flows. Ninety acres of skyline yarding (28 percent) and 6 acres (2 percent) of ground-based yarding would occur with this project.

To minimize sediment movement and interruption of potential flow paths, (where ground-based yarding would occur) logging debris would be placed on skid trails to protect soil and deflect and redistribute overland flow to areas where it would infiltrate into undisturbed soil.

Water Quality

Fine Sediment

Proximity of ground disturbance to streams is an important factor controlling sediment delivery. A research study on buffers found that of 212 erosion features within 30 feet of a stream, 67 percent of the features delivered sediment to the stream. Conversely, of 193 erosion features

greater than 30 feet from a stream, 95 percent did not deliver sediment to the stream (Rashin et al. 2006).

Given that most of the units have SPZs greater than 50 feet protected from ground disturbance, it is unlikely that additional sediment would be delivered to the streams from activities associated with this project.

Over the next decade (Snook 2007), the riparian area that would be thinned would be more susceptible to wind throw. This could make minor amounts of sediment available for transport to the stream and in a large event could reduce shading and lead to increased temperature for the stream. Any of these effects would be short-term (less than 5 years) until the openings reestablished vegetation. A large wind event that could lead to an addition of large wood to the stream would be considered a positive effect.

This project is unlikely to affect stream channel stability and function, as most areas would be protected with at least a 50-foot SPZ. All Riparian Buffer Study area yarding would occur with helicopters which cause very little ground disturbance. No bank stabilizing vegetation would be removed. Any wood, which fell within the SPZ, would be left on site unless full suspension lift would occur with a helicopter. This project would remove wood that could potentially become large woody debris in the streams. Overtime, larger trees produced by thinning would fall into streams adding complexity to the channel.

By implementing the design features to minimize movement of sediment to streams, it is unlikely that thinning would lead to measurable increases in sediment delivery to streams, stream turbidity, and alteration of stream substrate composition, channel morphology, or sediment transport.

Stream Temperature

A comparison of thinning treatments and the effects on stream temperature showed that thinning both the primary and secondary shade zones along 6 miles of stream lead to a little more than 3 degrees Celsius increase in temperature. Thinning only the secondary zone gave no measurable increase in stream temperature. There was a little more than half a degree change in temperature after one mile of thinning within the primary and secondary shade zones (USDA Forest Service and USDI BLM 2005).

Results from preliminary data in the microclimate studies show that microclimate gradients were strongest within 30 feet of stream center, a distinct area of stream influence within broader riparian areas. Thinning resulted in subtle changes in microclimate as mean air temperature maxima were 1 to 4 degrees Celsius higher than in unthinned stands. With buffer widths, 50 feet or greater, daily maximum air temperature above stream center was less than one degree Celsius greater, and daily minimum relative humidity was less than 5 percent lower than for unthinned stands (Anderson et al in press 2007). Most SPZs are greater than 50 feet and therefore would show very small changes between thinned and unthinned units.

The primary shade zone (approximately 50 feet) along streams provides shade during the hottest part of the day and the secondary zone (approximately 50 to 100 feet) would provide additional shade during the early morning and evening hours. To provide sufficient shading the SPZ need to be at least as wide as the primary shade zone. For the project area streams, 55 feet on each side of the stream is considered the primary shade zone (see McFall Creek Silviculture Prescription).

The DMS buffers/SPZs are unchanged from the initial thinning (10 years ago) for all Units except 31L. Stream buffers established for this project are compliant with shade sufficiency analysis

shown in Silviculture Prescription (NEPA File). The exceptions to the above statement are the SPZs in the Callahan Creek Riparian Buffer Study area. The smaller SPZs range from zero in Unit 31L to 25 feet in Units 31D and 31E.

The SPZs in Units 31D and 31E are not large enough to include the entire primary shade distance. Thinning within the primary shade zone can lead to increases in stream temperatures. It is anticipated that temperatures could be higher along streams with the 20 to 25-foot SPZ than along streams with at least 50-foot SPZs. However, canopy cover would remain above 40 percent based on modeling.

Approximately half the trees in unit 31L would be removed leaving approximately 54 trees per acre. Both the overstory and understory would be thinned leaving the trees with the largest crown ratio. Modeling showed canopy cover decreasing from 67 percent to 42 percent. In reality, canopy cover is presently closer to 90 to 100 percent on much of the stream as the red alders tend to lean over the stream.

However, there would be a loss of canopy cover, which could lead to an increase to solar radiation particularly in the middle of the day. Given the north-south orientation of Callahan Creek, the 5 to 6-foot incision along the west bank of the stream channel (seen during the field review of the units) would add shade in the late afternoon. The area to be thinned along Callahan Creek is approximately 1,000 feet long with SPZs both upstream and downstream of Unit 31L. Forest Visual Simulation modeling did not show a large increase in canopy cover over time for Unit 31L (Snook, personal communication). Possibly this is because the stand is primarily mature red alders that are unlikely to show a large change in crown cover after thinning.

Theoretically, in these Units 31D, 31E and 31L, the reduction in shade could result in increased heat load to the treated segments of these streams. On hot summer days during low flow this could result in higher peak temperatures (Moore et al 2005). This effect, if it occurs, would be documented by stream temperature monitoring during the DMS. The effect would diminish over time as the remaining stand fills in canopy openings and increases stream shade. Another study in the Oregon Coast Range showed that shading and stream temperature along small headwater streams had recovered in 10 years (Moore et al 2005). Thermal impacts would also be expected to diminish with distance from the treatment sites as water flows downstream through untreated areas that retain their natural temperature regime.

Dissolved Oxygen (DO) levels could be depressed within Unit 31L due to an increase in stream temperature. Change would be expected to diminish over time. In addition, changes in DO would be expected to diminish with distance from the treatment site and would continue only until the riparian area shading recovered.

There could be a short-term (1 to 2 years) increase in sediment from logging next to the stream in some of the Riparian Buffer Study units. Because thinning would occur up to the banks of the stream, there is a greater risk of sediment delivery to streams. This would occur for only 1 to 2 years until vegetation provided ground cover to bare soils. To minimize this risk, trees would be felled away from streams whenever possible. To minimize sediment input to the stream, helicopter logging with full suspension would be used to yard logs. If trees fall across streams in Unit 31L, design features would require the tree to be cut at bankfull and the part of the tree in the stream would be left on site.

Pile Burning
Burning piles could produce small areas without soil cover that are more susceptible to erosion. Burning could also produce patches of bare soil with altered properties that restrict infiltration. Piles would occupy very small areas surrounded by larger areas that would absorb runoff and trap any sediment that moved from the burn sites. The burned areas would be expected to reestablish vegetation entirely within one to two growing seasons. No burning would occur within SPZs to protect water resources.

Road Work and Hauling
The main haul road used in this area, (Valsetz Mainline Road) produces fine sediment during the rainy season. Weyerhaeuser Company recently improved this road in August/September 2007 with the installation and/or replacement of culverts. This work will reduce the connection from the road to streams and thus reduce fine sediment from entering the stream.

Road renovation would occur on approximately 6 miles of road. There may be short-term increased sediment delivery to streams from road work and culvert replacement for the year after the work occurs. For further protection of water resources, design features state that during periods of rainfall when water is flowing off road surfaces, the Contract Administrator may restrict log hauling to minimize water quality impacts, and/or require the Purchaser to install silt fences, bark bags, or apply additional road surface rock.

3.2.4 Fisheries/Aquatic Habitat

(IDT Reports incorporated by reference: McFall/Potter Creek Density Management Project Fisheries Report, pp. 1-23)

Affected Environment

Projects 1 and 2
The relevant fish-bearing streams affected by the proposed projects are Potter Creek, McSherry Creek, Sand Creek, McFall Creek, and Callahan Creek. The proposed density management projects would treat 487 acres limited to two drainages, the headwaters of South Fork Siletz River and Upper South Fork Siletz River.

Project 3
The LWD placement work is proposed to occur in ½-mile of Potter Creek and ¼-mile of McSherry Creek totaling ¾ miles of treated streams in the Upper South Fork Siletz River drainage.

Habitat Conditions

South Fork Siletz River
Instream structure is at low levels in most areas of the Upper Siletz River watershed because of past removal from the stream channel to prevent fish passage problems following logging operations and to prevent jams that trigger floods, damage bridges, or interfere with boat traffic (ODFW 1997). Additionally, logging of large trees from RR has cut off the primary source of continued recruitment of LWD to the stream channels. The situation is aggravated because red alder trees rather than conifer trees (that provide a much better and more durable source of instream structure) now dominate the RR.

Oregon Department of Fish and Wildlife habitat surveys have been conducted on the major tributaries within the project areas including Potter Creek, McSherry Creek, Sand Creek and tributary, and McFall Creek. As noted in the McFall/Potter Creek Density Management Project Fisheries Report (Table 2) LWD is deficient in all reaches surveyed by ODFW. The lack of LWD in ODFW surveyed reaches and concerns that were noted in the ODFW Siletz River Management Plan (1997) and the

scarcity of LWD noted in the USWA (BLM 1996) suggest that LWD is likely deficient in all reaches of the project area.

Impaired habitat conditions within the project area include lack of pools, fine sediment, and LWD based on ODFW habitat surveys. Stream shade and gravel percentages were at or nearly meeting desired benchmark conditions in the project affected reaches. Stream channel width to depth ratio is mixed with most stream reaches in desirable conditions (except for portions of Sand Creek and its tributary in the project area). The lack of LWD is likely impairing the quality and abundance of pool habitat throughout the surveyed reaches. While gravel abundance is considered adequate, the undesirable amount of silt/sand documented in the surveys likely impairs functionality of the gravels as spawning/incubation habitat.

Fish Distribution:
Spring Chinook are known to occur in the main stem South Fork Siletz River 4 miles downstream from the project area (Streamnet 2006). Coho salmon and winter steelhead are currently blocked from the Upper Siletz River at the Siletz Falls 12 miles downstream from the project area (ODFW 1996).

The Siletz River currently contains the only native summer steelhead run in the Oregon Coast Range north of the Umpqua River basin (BLM 1996b). Summer steelhead is presumed to reach habitat within the project area (Streamnet 2006).

Fish presence surveys were completed in the spring of 2006 and confirmed the presence of resident cutthroat trout on BLM managed land within Potter Creek and McSherry Creek (Calver and Snedaker 2006). McFall Creek contains cutthroat in the lower reaches, but fish are unable to move past a waterfall approximately 500 feet from the northern project boundary (BLM 1997; Calver and Snedaker 2006). Cutthroat are present thru the BLM managed lands of both Sand Creek tributary, in the northwest quarter, and the main stem of Sand Creek thru Section 31 (Calver and Snedaker 2006). Trout were found in Callahan Creek to a steep cascade upstream of the confluence of the major drainages in Section 31. Sculpin species were documented in low gradient channels of Potter Creek adjacent to the Valsetz Mainline Road (Calver and Snedaker 2006) and for purposes of this analysis are assumed present in all habitats utilized by cutthroat trout. Based on field review of the stream crossings associated with the proposed haul route within the Upper Siletz River watershed there are 6 fish-bearing crossings.

<u>Luckiamute River</u>
Several fall barriers have been identified in the Luckiamute River watershed that forms the upper limits for anadromous species. The falls at Falls City is the limit for winter steelhead in the Little Luckiamute River (Streamnet 2006). A falls located at the eastern boundary of BLM lands in Township 8 South, Range 6 West, Section 31 is the upper limits for winter steelhead in Teal Creek.

Fish Distribution:
Based on field review, cutthroat trout are known to be present above the falls in Falls City. The precise upper limits of cutthroat trout distribution in the Little Luckiamute River subwatershed are unknown. Cutthroat trout are documented upstream of the falls on Teal Creek in Township 8 South, Range 6 West, Section 31. However, field review upstream of a large waterfall on North Fork Teal Creek in Township 8 South, Range 7 West, Section 36 indicated no fish presence. Based on field review of the stream crossings associated with the proposed haul route within the Luckiamute River watershed there are no fish-bearing crossings (graveled roads). The upper limit of fish distribution is unknown for the affected streams therefore the distances from the stream crossings to resident fish habitat are unknown.

Chinook salmon are located in the lower reaches of the Luckiamute River over 25 miles downstream from the haul route.

The coho salmon present above the Willamette Falls are part of an introduction effort that occurred during the 1900's (ODFW 1992). No active supplementation is known to occur in the Upper Willamette basin at this time. Currently, naturally produced coho salmon are returning to many tributaries of the western side of the Willamette River including the Luckiamute River, typically concurrent with winter steelhead distribution.

Endangered Species

Upper Willamette River Steelhead Trout

The UWR (Upper Willamette River) steelhead trout is listed as threatened under the Endangered Species Act. Upper Willamette River winter steelhead is suspected to be present in Teal Creek up to the first barrier falls in Township 8 South, Range 6 West, Section 31. Streamnet (2006) distribution places the upper limit of winter steelhead in Teal Creek part way into BLM managed land in Township 8 South, Range 6 West, Section 31. Streamnet also places the upper limit of UWR winter steelhead in the Little Luckiamute River to the falls in Falls City (Township 8 South, Range 6 West, Section 21). Upper Willamette River winter steelhead distribution is over 1-mile downstream from the unpaved haul route in Little Luckiamute River, 1.8 miles in Teal Creek, and over ¾ of a mile upslope of the upper reach of the Luckiamute River (see Maps 1 and 2 in Fisheries Report).

Upper Willamette River Chinook Salmon

Upper Willamette River Spring Chinook salmon are known to reside in the lower reaches of the Luckiamute River, 25.5 miles downstream from the haul route (Streamnet, 2006). The NMFS has listed spring Chinook salmon in the UWR ESU (Evolutionarily Significant Unit) as threatened under the Endangered Species Act. No effects are anticipated to UWR Chinook salmon or its habitat due to distance to occupied habitat, and this species shall not be addressed further in this analysis.

Oregon Cub

Oregon chub historically resided in the lower portions of the Luckiamute River (Scheerer 1999). Oregon chub is listed as endangered under the Endangered Species Act. Currently there are no known chub populations residing in the Luckiamute River watershed. No effects are anticipated to Oregon chub historic habitat; therefore, this species shall not be addressed further in this analysis.

Oregon Costal Coho Salmon

Oregon Coastal (OC) Coho salmon were delisted under the Endangered Species Act on January 19, 2006. The BLM is aware of the recent court magistrate findings that questioned NOAA's 'Not Warranted' listing of OC Coho salmon. Oregon Department of Fish and Wildlife passage policy above the Siletz River Falls precludes coho salmon passage (ODFW 1997); therefore, coho salmon would be more than 12 miles downstream from the project area. If OC Coho salmon status were to change, a 'No Effect' determination would be warranted largely based on the distance to project activities from occupied habitat and this species shall not be addressed further in this analysis.

Environmental Effects

3.2.4.1 Alternative 1 (No Action)

Current timber stand conditions would be maintained. Expected benefits of thinning riparian stands would not be realized. The existing road network would remain unchanged. Impacts to aquatic habitat would be unlikely with the implementation of the No Action alternative.

3.2.4.2 Alternative 2 (Proposed Action)

Yarding/Falling
The low elevation of the proposed action was considered unlikely to detectably alter stream flows (Thornton 2007). 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 31A, 31C, 31F–31K, 31M, and 31N included a standard SPZ of at least 50 feet. Treatment in Units 31D and 31E would include actions within 20 to 25 feet of stream channels. Unit 31L would have no SPZ. Due to the closer proximity of Units 31D, 31E, and 31L, these units are discussed separately from the other units for effects to aquatic habitat.

Units 31A, 31C, 31F–31K, 31M, and 31N
Based on the shade sufficiency analysis (Snook 2007), the Hydrology Report water quality analysis (Thornton 2007), and the project design features, the proposed actions are unlikely to affect temperatures, thus fish habitat would also be unaffected both at the treatment site and downstream by temperature changes.

Based on the riparian stand analysis, the proposed action would retain trees that would reach larger diameters earlier compared to the no action alternative, creating natural opportunities for higher quality LWD recruitment in the long-term (Snook 2007). In the short-term, smaller woody debris would continue to fall from within the 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. 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 riparian areas 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.

The proposed project actions in Units 31A, 31C, 31F–31K, 31M, and 31N are unlikely to result in any measurable changes in sediment delivery to the surrounding stream network that could affect the turbidity, substrate composition, or the sediment transport regimes (Thornton 2007). The dominant use of helicopter yarding, SPZs, 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 adjacent to or downstream from the project area.

Units 31D, 31E, and 31L
Portions of Units 31D, 31E, and 31L include treatments within 55 feet of the stream channel. Those treatments may result in sediment reaching stream channels, increases in solar radiation reaching streams, and reducing dissolved oxygen (Thornton 2007). These effects could impair the quality of aquatic habitat. Effects to habitat and fish would vary as specific conditions of the affected stream contribute to magnitude and duration of effects. Increased LWD/CWD supply, due to falling of streamside timber that is retained on site, could provide positive benefits to habitat, increasing cover and habitat complexity. However, falling may also result in stream bank disturbances, which could cause sediment movement into the stream channel. Fish would be expected to move away from disturbed areas and reoccupy habitat following harvest activities.

The effects to fish from changes in temperature and sediment are anticipated to be short-term and localized; impacts would diminish over time as vegetation recovers and with distance from the treatment area.

Hauling

The rocked haul route includes approximately 2 fish-bearing and 14 non-fish-bearing stream crossings in the Upper Siletz River watershed and approximately 20 perennial and intermittent stream (all non-fish-bearing) crossings in the Luckiamute River watershed. All haul routes would be available for hauling year round, subject to shut down during high precipitation events.

Luckiamute River Watershed

Based on the hydrology analysis some sediment generation is expected from hauling on the road segments within the Luckiamute River watershed (Thornton 2007). However, the proposed year round hauling on rocked and paved roads in the Luckiamute River watershed is not expected to result in detectable quantities of sedimentation reaching fish-bearing streams primarily due to the distance of stream crossings to occupied fish habitat, at least ¾ miles downstream. Sediment that may reach the non-fish-bearing streams associated with the haul route crossings would likely be absorbed into the channels before reaching fish habitat (Duncan et al, 1987). Implementation of recently completed road renovation work (Weyerhaeuser Company) is expected to nearly eliminate road surface connectivity with the non-fish-bearing streams and would serve to eliminate the potential for sediment reaching downstream fish habitat as a result of hauling.

Upper Siletz River Watershed

The proposed year round hauling on rocked roads in the Upper Siletz River watershed may result in minor short-term increases in sediment reaching 2 fish-bearing stream crossings and 14 non-fish-bearing stream crossings. Due to the presence of fish-bearing crossings and the elevated risk of sediment reaching these streams, it is reasonable to expect an indirect short-term negative impact to aquatic habitat from hauling. The magnitude of sediment generated at the site level that could reach fish-bearing streams would be minimized with application of native surface seasonal restrictions, sediment control design features (silt fences, hay bales etc…), and cessation of haul during heavy rainfall. Any sediment that would reach the stream channels from the haul route crossings would likely be absorbed into the channels, limiting the extent of fish habitat affected (Duncan et al, 1987). The duration of sediment reaching the streams, fish-bearing and non-fish-bearing, would be short-term (occurring during the wet season during and immediately following hauling activities). Fish would be expected to move away from crossings where sediment may be elevated and would be expected to reoccupy habitat following hauling activities. Site-specific effects to fish habitat downstream of the intermittent stream crossings in this watershed are not anticipated. Sediment generated from hauling over non-fish-bearing crossings (within a half mile) may reach fish habitat in the following wet season; however, the magnitude is expected to be undetectable against background turbidity.

Road Renovation

Road renovation treatments (rocking, grading, spot rock applications and ditch line reconstruction), would be expected to result in a minor short-term increase in erosion in the winter following work (Thornton 2007), until reestablishment of vegetation in the subsequent growing seasons. Renovation near fish-bearing crossings may result in an indirect short-term negative impact to fish in the first winter following treatment. Most generated sediment related to road renovation would likely be quickly absorbed into the channel bedload (Duncan et al, 1987), minimizing the amount of sediment exposure to fish. Fish would be expected to move away from crossings were sediment may be elevated during early winter heavy rainfall events when introduction of sediment is most likely and would be expected to quickly reoccupy habitat as road

surfaces harden. Sediment generated from non-fish-bearing crossing treatments within a half mile may reach fish habitat in the following wet season; however, the magnitude is expected to be undetectable against background turbidity. The proposed road renovation work is intended to improve drainage and road surface conditions, resulting in less erosion into the surrounding area over time.

Pile Burning
Burning piles could produce small areas susceptible to erosion and restricted infiltration (Thornton 2007). However, vegetation buffers would surround burned areas and no burning would occur in SPZs. Slash burning with the use of these mitigating design features is not anticipated to negatively affect the aquatic environment.

3.2.5 Wildlife

(IDT Report incorporated by reference: Biological Evaluation for McFall/Potter Creek Density Management Timber Sale, pp. 1-9)

Affected Environment

All Project Areas
The landscape at the subwatershed scale (sixth-field South Fork Siletz River) is a checkerboard of federal and private forest lands with the majority of the land being in private ownership. Wildlife habitat on private lands surrounding the project area can be characterized as a patchwork of early (0 to 39 years) and mid-seral (40 to 50 years) conifer forest stands. Habitat conditions on BLM managed lands in the subwatershed are dominated by mid-seral (60 to 79 years) forest stands. Early and mid-seral forests in the central Coast Range of Oregon 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 live or dead trees and large wood (greater than 24 inches DBHOB) remaining from the previous stand. Under the current management plan, the desired future condition for the BLM forests in this subwatershed is late-seral/old-growth habitat. The development of any significant interior late-seral/old-growth habitat may not be attainable in the sub basin since the largest possible contiguous stand is 560 acres and all future 80 plus year old stands would always be surrounded by hard contrast edges (private land). The McFall and Potter Creek stands are also isolated from existing late-seral/old-growth stands (over 4 miles) and from BLM stands greater than 640 acres (over 5 miles).

Big Game Animals – The Valsetz Elk Herd
Lands within and adjacent to the proposed action area are home to the largest (150 to 300 animals) resident Roosevelt elk herd in the Marys Peak RA. Known as the Valsetz Herd, the elk are managed by ODFW and fall within their Stott Mountain and Alsea Game Management Units. The area has been designated the *Luckiamute Cooperative Travel Management Area* by ODFW. In order to protect elk habitat, minimize harassment to elk, and promote quality hunting; all motorized vehicle travel, camping, and fires are prohibited within the travel management area. The early- and mid-seral habitat on private land provides fair foraging opportunities and very good escape, hiding, and thermal cover. The closed canopy mid-seral forests on BLM managed lands generally provide poor foraging opportunities, fair escape, hiding cover and good thermal cover.

Special Habitats & Special Habitat Components
There are no known special habitats (oak woodlands, cliffs, caves, talus, wet/dry meadows, lakes, waterfalls, ponds, etc.) in any of the three project areas.

Special habitat components most important to wildlife in conifer forests of the Oregon Coast Range are larger diameter (greater than 24 inches DBHOB) live and dead trees. Open-grown green trees with the greatest live crowns (wolfy trees) and/or with deformities like broken tops and witches' brooms provide the most complex structure, and meet more wildlife needs than an average tree in the stand. Larger diameter dead trees, (both snags and CWD), especially those with the hardest wood (least decayed) would, over time, meet the needs of more wildlife species than the smaller dead trees with softer wood. These special habitat components are commonly described as legacy or remnant structure. This complex structural component makes for a healthier functioning forest ecosystem. Remnant structure, both live and dead, is uncommon in the early and mid-seral stands within the action area. The mid-seral stands to be treated in Project 1 are lacking in quality and quantity of large dead wood when compared to similarly aged stands of unmanaged forests. There is a substantial amount of recent blowdown along the western edge of Project 2 that would remain on site as a high quality patch of CWD. The remainder of the project areas are lacking in high quality snags and CWD.

Special Status Species

Northern Spotted Owl: The project area is not within Reserve Pair Area habitat or designated critical habitat. The mid- and late-seral stands in Projects 1-3 provide dispersal, roosting, and foraging habitat. The complex structure necessary for suitable nesting habitat is still lacking in these relatively young (66 to 79 years) stands. Once the stands in Projects 1 and 2 attain owl-nesting suitability, they may still be unable to sustain a nesting pair because of the isolated and fragmented nature of the BLM managed lands in the South Fork Siletz River subwatershed. Over the past 30 years owl surveys in and around the project area on both private and public lands have revealed a lack of nesting owls. The closest known active owl sites are about 5 miles to the south and east of section 31.

Marbled Murrelet: Murrelet surveys completed in the Project 1 area (during the 1993 to 1994 and 2005 to 2006 breeding seasons) did not detect presence. The proposed action is not within designated critical habitat and the mid- and late-seral stands in Projects 1-3 are still too young to provide suitable nesting structure for the murrelet. Once the mid- and late-seral stands in Projects 1 and 2 attain murrelet nesting suitability they may remain unused by murrelets because of their distance from the ocean and isolated and fragmented nature of the BLM managed lands in the South Fork Siletz River subwatershed. The closest known occupied marbled murrelet site is over 6 miles to the northwest of Project 2.

Mollusks: Five Bureau Sensitive mollusks (three slugs and two snails) may occur within the Marys Peak RA however, they have not been found since mollusk surveys began in 1997. These mollusks are unlikely to occur within the project area, and surveys completed in the winter of 2006 did not detect presence. Fall surveys would be conducted in 2007 and if Bureau sensitive mollusks were found, their sites would be protected in non-research units (Units 31A, 31I, 31J, and 31M).

Special Attention Species

Red Tree Vole: Red tree vole surveys occurred during the spring of 2007 in the 79-year-old stands of Project 1. Four trees were found that have nest structures. None of the nests are active red tree vole nests and intensive surveys within 100 meters of each tree found no additional nest structures of any kind. The likelihood of finding red tree voles, now or in the future, in the South Fork Siletz River subwatershed is very low due to past and present timber harvesting activities and its isolation from any late-seral/old-growth habitat.

Evening Fieldslug: The evening fieldslug is suspected to occur within the Marys Peak RA but has never been found. The slug is closely associated with riparian zones and standing water. Surveys

completed in the winter of 2006 did not detect presence. Fall surveys would be conducted in 2007. If the mollusk were found it would be protected in non-research units (Units 31A, 31I, 31J, and 31M).

Environmental Effects

3.2.5.1 Alternative 1 (No Action)

Under the No Action alternative the thinnings, creation of patch cuts, and creation of snags and CWD would not occur. The mostly uniform, single-layered 66 to 79-year-old stands would continue to grow and develop into mature structure at a much slower rate then if released through thinning. Species dependent on larger and more complex structure, (both live and dead), would avoid these stands for a longer period. Elk foraging opportunities would not be improved.

3.2.5.2 Alternative 2 (Proposed Action)

The proposed density management treatments of Project 1 are designed to accelerate the structural development of these stands into late-seral habitat. These actions would have long-term positive impacts for species dependent on interior late-seral forest habitat in the subwatershed by creating larger trees in less time.

At the stand level, the silviculture prescription for Project 1 would generally remove the suppressed, intermediate, and smaller co-dominant Douglas-fir and leave the dominant and larger co-dominant Douglas-fir. Where western hemlock occurs in clumps/dense patches, they would be thinned. Post-treatment densities would range from approximately 25 to 65 TPA. Since the largest trees with the best crown ratios would generally be left, the post-treatment crown canopy is expected to be 40 percent or greater over most of the project area. The most substantial short-term impacts (lasting about ten years), would be a simplification of overstory stand structure due to the removal of green trees along with an increase in complexity and diversity in the understory structure due to an increase in light penetration. Since there is a continuous presence of mid-seral habitat in the watershed, any short-term negative impacts to species dependent upon this type would be insignificant.

Big Game – The Valsetz Elk Herd

Forage availability is a limiting factor to the viability of the Valsetz elk herd. The proposed density management action in Project 1 would improve the conditions for forage availability and persistence in the watershed. Opening up the overstory canopies of the stands would allow more light to hit the forest floor, which would encourage the growth of elk forage. To provide some long-term early-seral grass/forbs/shrub foraging habitat immediately adjacent to mature forest cover, several openings (patch cuts) would also be created.

Special Habitat Components

Most of the stands in Project 1 are at or just under 80 years old and all are lacking in volume of large, hard, dead wood when compared to unmanaged stands their age. Five trees per acre would be topped for snags, and 2 trees per acre would be cut for CWD in order to improve the dead wood conditions in these late-seral stands. These actions are expected to have no known negative impacts to stand composition or function, and have both immediate and long-term positive impacts for species that require complex large structure associated with the late-seral forest environment.

Special Status Species Impacts

Northern Spotted Owl: This project would degrade dispersal habitat but the stands are still expected to function as dispersal habitat after treatment. The long-term impact of density management on owls would be positive since the existing habitat would develop into suitable nesting habitat sooner then if left unthinned. Project 1 would also have immediate and long-term positive impacts for owls by improving prey habitat by the creation of large dead wood in the stands.

Marbled Murrelet: Treatment of the mid- and late-seral habitats in Projects 1 would have long-term positive effects by accelerating the time it would take for these stands to develop into suitable nesting habitat.

Mollusks: None of the listed species are expected to occur within the project area, however, if any of the mollusks are found during the Fall 2007 surveys, then potential negative impacts would be mitigated in Units 31A, 31I, 31J and 31M through buffering and withdrawing the site(s) from any timber harvest activity.

Special Attention Species Impacts

Red Tree Vole: The action would have a positive impact on red tree vole habitat since the vole prefers late-seral habitat and the proposed treatments would accelerate the development of these conditions within the selected stands.

Evening Field Slug: The evening field slug is not expected to be found within the project area. If any slugs were found during the Fall 2007 surveys, then potential negative impacts would be mitigated in Units 31A, 31I, 31J, and 31M through buffering and withdrawing the site(s) from any timber harvest activity.

3.2.6 Fuels/Air Quality

(IDT Reports incorporated by reference: McFall/Potter Creek Density Management Fuels and Soils Report, pp. 1-22)

Affected Environment

The project area is occupied by stands of 72 to 79-year-old Douglas-fir. A few areas are in a fully stocked condition while most areas are occupied by stands that have been commercially thinned in the last 10 years. Understory vegetation is mostly a moderate to light growth of sword fern, salal, and vine maple on the uplands with heavier brush near draws, openings in the canopy, and thinned areas. Salmonberry and red alder are common on the wetter sites. Estimates for present fuel loading yields the following:

- ✓ Dead fuels on the ground vary depending on whether the area had been recently thinned or not and if thinned, to what degree.
- ✓ For all sites: duff on the benches ranges between ½ to 3 inches. Large (over 36 inches DBHOB) decayed stumps from the previously logged stands are scattered throughout averaging around 20 per acre. A few large logs left from the original logging are randomly scattered through out the sites. Smaller down logs from the second growth stand are well distributed through out the stands.
- ✓ For areas not recently thinned: fuels less than 9 inches DBHOB average less than 7 tons per acre, larger fuels over 9 inches DBHOB average less than 20 tons per acre. Large snags over 20 inches DBHOB are less than one per acre however smaller snags are abundant.

- ✓ For areas recently thinned: fuels less than 9 inches DBHOB range between 8 to 17 tons per acre, larger fuels over 9 inches DBHOB average less than 20 tons per acre Large snags over 20 inches DBHOB are less than 1 per acre, smaller snags are nearly absent. In both thinned and unthinned areas, there are scattered pockets of recent wind thrown trees. Most of these blown down trees would be left on site as down wood. Where there is recent blowdown the large fuel loading is 30 to 50 tons per acre.

Environmental Effects

3.2.6.1 Alternative 1 (No Action)

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)

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 10 to 20 tons per acre of dead fuel to the thinned areas and 25 to 35 tons per acre of dead fuel to the patch cut 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, when needles dry out but remain attached. These highly flammable “red needles” generally fall off within one year and risk of a fire start greatly diminishes. Fire risk would continue to diminish as the area "greens up" with understory vegetation and as the fine twigs and branches in the slash begin to break off and collect on the soil surface. The resulting total residual dead fuel loading would vary through out the site ranging from 10 to 45 tons per acre. It is expected that 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, if a fire started under dry summer or early fall conditions, the increased slash loading in the thinned stands would likely result in high mortality from scorch.

Air Quality

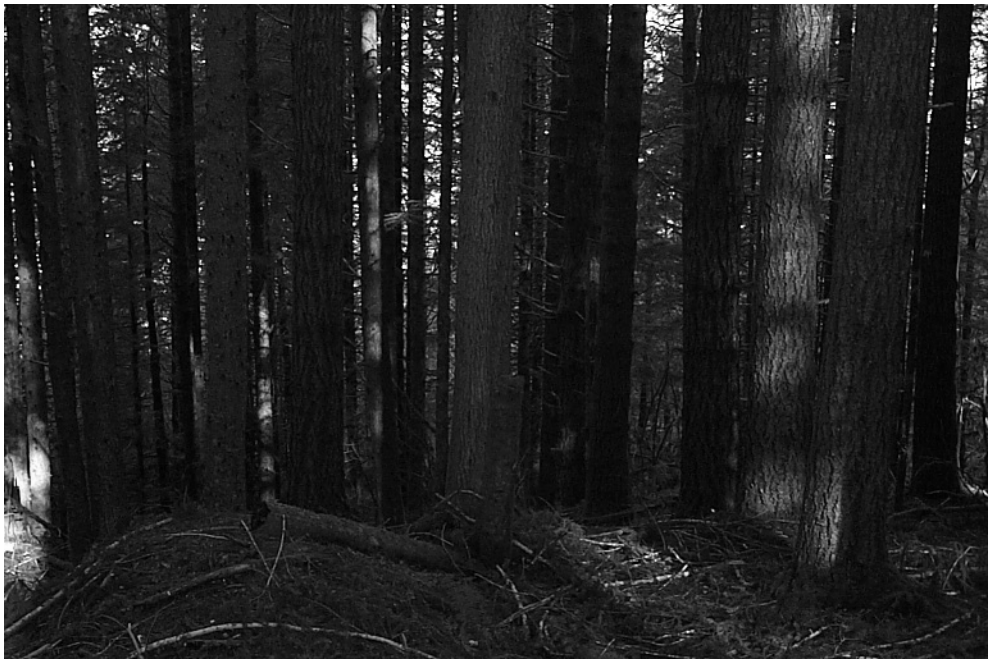
Burning approximately 1,550 tons of dry, cured piled fuels under favorable atmospheric conditions in the Oregon Coast Range is not expected to result in any long-term negative effects to air quality in the airshed. Generally, once covered dry piles have been ignited, the fire intensity builds rapidly to a point where the fuels burn cleanly and very little smoke is produced. 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. Burning of slash would always be coordinated with ODF (Oregon Department of Forestry) in accordance with the Oregon State Smoke Management Plan, which serves to coordinate all forest burning activities on a regional scale to prevent negative impacts to local and regional airsheds.

4.0 PROJECT 2 – POTTER CREEK DENSITY MANAGEMENT

4.1 Purpose of and Need for Action

The BLM proposes forest management activities on approximately 170 acres of 66 to 70–year-old stands. These activities may include timber harvest, road construction, reconstruction, renovation, and decommissioning. The land use allocations for these activities are Adaptive Management Area and Riparian Reserves.

The following describe the purpose for the action:



Area of dense trees near Potter Creek. Density varies from clumps such as this to small gaps.

- **Implement a subset of the specific management opportunities that were identified within the USWA and NCAMA consistent with AMA objectives (RMP p. 19) and standards and guidelines outlined above in Section 1.3, to:**
  - ✓ Restore and maintain late-successional forest conditions which serve as habitat for late-successional forest species, which can be consistent with marbled murrelet guidelines;
  - ✓ Create terrestrial large down wood;
  - ✓ Provide a stable timber supply.

- **Manage early- to mid-seral stands in RR LUA (RMP pp. 9-15) to:**
  - ✓ Accelerate growth of trees to restore large conifers to RR (RMP p. 7);
  - ✓ Enhance or restore habitat (e.g. CWD, snag habitat, instream large wood) for populations of native riparian-dependent plants, invertebrates, and vertebrate species can be (RMP p. 7);
  - ✓ Improve structural and spatial stand diversity on a site-specific and landscape level in the long-term (RMP pp. 11 and D-6).

- **Maintain and develop a safe, efficient and environmentally sound road system (RMP p. 62) to:**
  - ✓ Provide appropriate access for timber harvest and silvicultural practices used to meet the objectives above;

- ✓ Provide for fire vehicle and other management access;
- ✓ Reduce environmental effects associated with identified existing roads within the project area.

- **Supply a marketable density management sale to:**
  - ✓ Contribute to a sustainable stable supply of timber for local and regional economies, and
  - ✓ Contribute to community stability (RMP p. 20), as reflected in the Salem District ASQ (allowable sale quantity) (RMP, pp. 1, 46, 47) in the AMA portion of the project area (NCAMA, p. 2).

Marys Peak RA staff performed a comprehensive, landscape level analysis to determine relative priority of watershed areas within the RA for ecosystem management. Assessments of watershed, wildlife, silviculture, transportation, and ownership conditions were made in comparison with provincial strategies to identify opportunities, needs, and their relative urgency. The proposed project area was chosen for density management of forest stands, improvement of late-successional habitat for marbled murrelet and northern spotted owl, and for improvement to the watershed and road system.

The proposed forest management activities within the AMA and RR LUA stands are needed to provide the gradual transition in structural characteristics of the treated stands to more closely resemble late-seral forest and to extend the persistence of hardwood tree and shrub cover diversity.

Existing roads within the project area contain culverts that are beyond their functional time span with rusted worn-out bottoms. The roads lack an adequate amount of rock to prevent environmental degradation during timber haul use.

There is a need to:
- ✓ Reduce stand densities using variable spacing methods;
- ✓ Create gaps;
- ✓ Renovate roads; and
- ✓ Offer a timber sale that can be sold and implemented through the market place.

The project would be implemented within a 3-year period that could commence in 2010.

4.2 Alternative Development

Pursuant to Section 102 (2) (E) of NEPA (National Environmental Policy Act 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 identified conflicts were unresolved. Therefore, this EA would analyze the effects of the Alternative 1 (No Action) and Alternative 2 (Proposed Action).

4.3 Alternative 1 (No Action)

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

4.4 Alternative 2 (Proposed Action)

This project consists of conducting density management on approximately 170 acres of 66 to 70-year-old stands within AMA and RR LUAs through a timber sale to be offered in 2010 (Potter Creek). Trees would be skyline yarded on approximately 30 acres, ground-based yarded on approximately 37

acres and helicopter yarded on approximately 103 acres. New road construction, reconstruction, renovation, and decommissioning new and reconstructed roads are also a part of the Proposed Action.

4.4.1 Connected Actions

1. **Road Work**: Road construction of approximately 1,568 feet, road reconstruction of approximately 265 feet and road renovation of approximately 2 miles would occur predominantly on or near ridge top locations. All of the road construction and reconstruction would be surfaced with an approximate 6 to 8 inch depth of rock. Following harvest, all of the new construction and reconstruction would be decommissioned and blocked to vehicular traffic. Drain dips would be installed where cross drainage is necessary. Within existing roads, spot rock application may occur.

   A portion (on BLM managed land) of Road #8-8-35, which is shown on the EA map, would be decommissioned by allowing natural reestablishment of vegetation to occur. This road is stable and has a low risk of erosion.

4.4.2 Project Design Features

The following is a summary of the design features that reduce the risk of effects to the affected elements of the environment described in EA section 3.1.

General
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-10).

Table 8: Season of Operation/ Operating Conditions

Season of Operation or Operating Conditions	Applies to Operation	Objective
During periods of low precipitation, generally May 1 to October 31	Road Construction/reconstruction/ renovation, helicopter landing construction	Minimize soil erosion/surface runoff
During periods of low soil moisture, generally June 15 to October 31	Ground-based yarding (Harvester/Forwarder and Hydraulic loader)	Minimize soil erosion/compaction
During periods of low tree sap flow, generally July 15 to April 15	Yarding outside of road right of ways (Skyline)	Protecting the bark and cambium of residual trees
During periods of low soil moisture, generally July 15 to October 15	Ground-based yarding (Tractor)	Minimize soil erosion/compaction

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:

- ✓ Ground-based yarding with crawler tractors, hydraulic loaders, or harvester/forwarders would take place generally on slopes less than 35 percent. Logging debris would be placed in skid trails in front of equipment to minimize the need for machines to operate on bare soil.
- ✓ Crawler tractor use would require utilization of pre-designated skid trails spaced an average 150 feet apart and be 10 feet or less in width. Utilize existing skid trails as much as practical.
- ✓ Harvester/forwarder use would require that logs be transported free of the ground. The equipment would be either rubber tired or track mounted, and have rear tires or tracks greater

than 18 inches in width. Skid trails would be spaced approximately 60 feet apart and be less than 15 feet in width.

- ✓ Hydraulic loader use would require utilization of pre-designated skid trails spaced at least 40 feet apart where they intersect boundaries and utilize existing skid trails as much as practical. Use of skid trails should be limited to one pass in and one pass out. Logging debris would be placed in skid trails in front of equipment to minimize the need for machines to drive on bare soil.
- ✓ Following completion of ground-based yarding, skid trails would be blocked where they are determined by the Contract Administrator to access main vehicular roads.
- ✓ Some main skid trails may be used as haul roads depending on harvest equipment used. This type of haul road would be restricted to the maximum width of 15 feet.
- ✓ 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. Yarding corridors would average approximately 150 feet apart where they intersect boundaries and be 15 feet or less in width. Lateral yarding up to 75 feet from the skyline using an energized locking carriage would be required.
- ✓ Waterbars would be constructed where they are determined to be necessary by the Contract Administrator.
- ✓ Timber hauling would be permitted year round on rocked surfaces. During periods of rainfall when water is flowing off road surfaces, the Contract Administrator may restrict log hauling to minimize water quality impacts, and/or require the Purchaser to install silt fences, bark bags, or apply additional road surface rock.
- ✓ All large areas of exposed mineral soil (roads to be constructed, reconstructed, renovated, skid trails, landings), as determined by the Contract Administrator would be grass seeded with Oregon Certified (blue tagged) red fescue (*Festuca rubra*), applied at a rate equal to 40 pounds per acre or sown/planted with other native species as approved by the resource area botanist. Prior to applying seed, the contractor would supply the BLM with the seed certification (blue tag) and seed label.
- ✓ Landings should be kept to the minimum size needed to accomplish the job and use existing road surface as much as possible. Two helicopter landings (approximately 1½ acres total) would be constructed; about ¼ of the landing area would be on existing or newly constructed road surface. All other temporary landings would be constructed primarily using the existing road surface and a small amount of area immediately adjacent.
- ✓ Helicopter yarding would be allowed year round, subject to soil conditions as determined by the Contract Administrator. Full suspension lift would be required.

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

- ✓ Stream protection zones would occur along all streams and identified wet areas within the harvest area. These zones would be measured to the slope break, change in vegetation, or with a range of 50 to 60 feet from the channel edge (depending on percent slope) which ever is greater.
- ✓ To protect water quality, all trees within one tree height of all 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 except in helicopter units where full suspension lift can occur. No skyline or ground-based yarding would be permitted in or through SPZs.
- ✓ No refueling would be allowed within 200 feet of any standing or running water (RMP, BMP C-8 and C-6). Spill containment equipment would be kept on site.
- ✓ Hauling operations would be suspended if weather or environmental conditions pose an imminent risk of road sediment flowing in road ditches.

To protect and enhance stand diversity and wildlife habitat components:

- ✓ Priorities for tree marking would be based on Potter Creek Marking Guidelines (see Appendix 2). Tree marking would be designed to thin from below, maintain existing variability in tree density where it exists, increase the proportion of minor species, and retain legacy and wildlife tree structure while meeting target densities.
- ✓ Thinning would occur primarily in Douglas-fir trees. Minor conifer species would be maintained except where they form dense patches, or occur in yarding corridors or skid trails. Understory conifers less than 7 inches would be excluded from harvest.
- ✓ All hardwoods would be retained except where they occur in yarding corridors or skid trails. Maintain existing hardwood species stand diversity, especially maples greater than 19 inches in diameter.
- ✓ Retain all plus trees (selected conifer for the genetics program).
- ✓ Trees would be retained that have unique structure and/or benefit to wildlife or botanical species. Any tree found to have a stick or ball nest, regardless of size would be protected.
- ✓ All existing snags would be reserved. Additional trees would be reserved around snags to protect them from logging operations and reduce the likelihood of their removal for worker safety reasons. Any snags felled or logs moved for these purposes would remain on site as close to the origin area as possible within the project area.
- ✓ Incidentally felled trees or topped trees (i.e. tailtrees, intermediate supports, guyline anchors, hang-ups, etc.) from harvest operations would be retained to function as CWD, as well as existing downed logs.
- ✓ Future supplementation of existing down wood levels would likely incorporate the following measures to reduce the probability of Douglas-fir beetle related mortality (Hostetler and Ross 1996) in the residual stands: (1) add no more than three Douglas-fir logs per acre greater than 12-inch DBHOB in a three-year period and (2) fall trees between July and the end of September.

To reduce fire hazard risk and protect air quality:

- ✓ Strategies would include directional falling (to keep slash away from fuel breaks), followed by a reduction of surface fuels in order to reduce both the intensity and severity of potential wildfires in the long-term. Fuels reduction would accomplished by burning of slash piles.
- ✓ Light accumulations of debris cleared during road construction/reconstruction 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.
- ✓ Heavy accumulations of debris on landings and within 30 feet of existing roads that would remain in drivable condition would be either machine or hand piled and burned as directed by the Authorized Officer.
- ✓ All piles would be located in locations suitable for burning at least ten feet away from reserve trees, snags, or unit boundaries. Piles should not be located on top of large logs or stumps. Larger piles would be preferable over small piles. Windrows would be avoided unless approved in advance by the Contract Administrator.
- ✓ The maximum width of the piles shall not be more than one and one half times the height. The piles shall be tight, free of earth, and free of projecting limbs or slash that would prevent adequate covering.
- ✓ In order to reduce the amount of material to be burned, material close to roads that is suitable for firewood should be set aside in accessible areas adjacent to the road and made available to the public. Wherever applicable and practical, logs larger than 12" in diameter shall be left scattered on site to help meet the down log requirement.
- ✓ During the late summer, before the onset of fall rains, all piles to be burned would be covered at least 80 percent with 4-millimeter (minimum thickness) black polyethylene plastic.

- ✓ The area would be monitored for the need of closing or restricting access during periods of high fire danger. During the closed fire season the first year following harvest activities, the area may be posted and closed to all off road motor vehicle use. The fuels specialist would determine whether an area should be closed or not.
- ✓ All burning would occur under favorable smoke dispersal conditions in the fall, in compliance with the Oregon Smoke Management Plan (RMP pp. 22, 65).

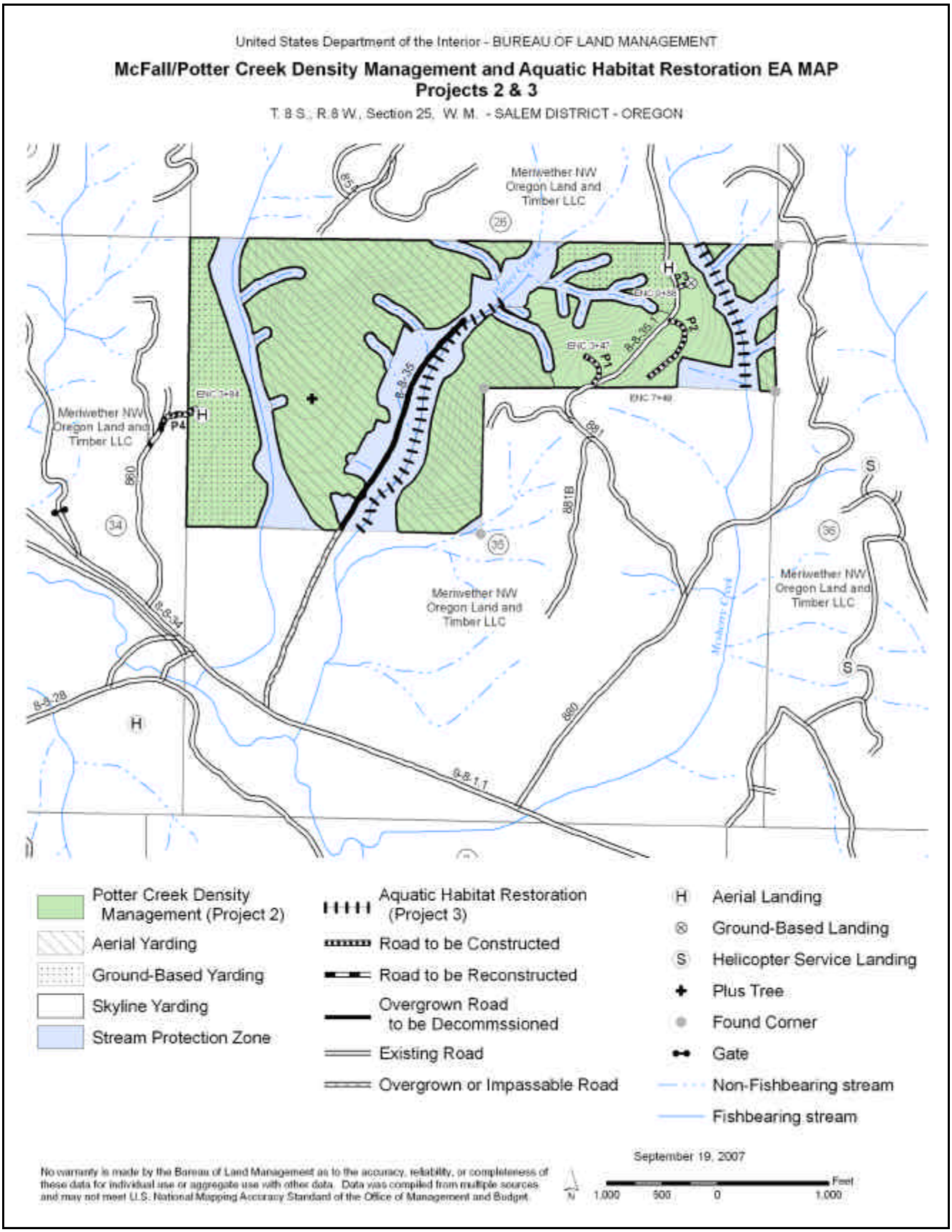
To protect Threatened and Endangered and Bureau Special Status Plants and Animals:

- ✓ Site management of any Bureau SS botanical and fungal species found as a result of additional inventories would be accomplished in accordance with, BLM Manual 6840- *Special Status Species Management* and the *Record of Decision, To Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines in Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (March 2004).
- ✓ The Resource Area Biologist and/or Botanist would be notified if any T&E and Bureau SS Plants and Animal species were found occupying stands proposed for treatment during project activities. All of the known sites would be withdrawn from any timber harvesting activity.

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 were discovered during project work until an archaeologist can assess the significance of the discovery.

Map 5: Map of Alternative 2 (Proposed Action for Projects 2 and 3)



4.5 Comparison of Alternatives With Regard To Purpose and Need

Table 9: Project 2 – Comparison of Alternatives by Purpose and Need

Purpose and Need (EA section 4.1)	Proposed Action	No Action
Late-successional forest conditions, which serve as habitat for late-successional forest species, can be developed, accelerated, and enhanced (NCAMA, p. 2).	Retains existing limbs on open grown trees through selective cutting of trees. Larger diameter trees felled for safety or operational reasons would be retained for CWD. Increases the quality and value of wildlife habitat.	Does not meet this purpose and need. Creates high level of small size CWD for the next decade or two in all stands within the project area.
Increase structural diversity in relatively uniform conifer stands.	Reduces tree densities within stands to increase diameter growth and more open stand conditions to preserve limbs and high crown ratios. Increases species diversity and understory regeneration, shrubs, forbs etc.	Does not meet purpose and need. Maintains a highly dense, uniform, small diameter stand of trees with receding crown ratios, loss of limbs, and loss of growth. Understory regeneration, shrubs etc. would be lacking.
Offer a marketable density management sale.	Offers approximately 3,750 MBF of timber for sale through 170 acres of density management.	Does not meet this purpose and need. No timber would be offered for sale.
Provides appropriate access for timber harvest and Silvicultural practices used to meet the objectives above, while minimizing increases in road densities.	Renovates approximately 2 miles, reconstructs approximately 265 feet, and builds 1,568 feet of new road.	No change. Maintains existing road densities in current maintained state.

4.6 Affected Environment and Environmental Effects

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

4.6.1 Vegetation

(IDT Reports incorporated by reference: Silviculture Prescription for Potter Creek Project, pp. 1-27, Botanical Report McFall/Potter Creek Density Management Project, pp. 1-15)

Affected Environment

Site Conditions

The project occurs in the Northern Oregon Coast Range at elevations ranging from 1,100 to 1,400 feet. The slope ranges from 0 to 60 percent, and generally drains to the south, though there are various aspects throughout the proposed project area. The climate is as described above in the Affected Environment for Project 1.

The stands belong to the Western Hemlock/vine maple-sword fern plant association, found on relatively moist sites in the Oregon Coast Range. In general, sword fern (*Polystichum minitum*),

Oregon oxalis (*Oxalis oregana*) are dominant forbs on the gentle slopes and benches while salal (*Gaultheria shallon*) and Oregon grape (*Berberis nervosa*) are dominant shrubs on upper slopes and ridges. Red alder (*Alnus rubra*), vine maple, and salmonberry (*Rubus spectabilis*) are dominant species in most of the larger riparian areas. Some of the gently sloped riparian areas are dominated by skunk cabbage (*Lysichitum americanus*) and golden carpet (*Chrysosplenium glechomaefolium*).

The major plant grouping as listed in the Salem District Proposed Resource Management Plan/Final Environmental Impact Statement (V.1, chapter 3, pp. 29-32) is the Douglas-fir/Red Alder/Salmonberry grouping which occurs on the west slopes of the Oregon Coastal Mountains.

Present Stand Condition and History

Approximately 57 acres of proposed density management occur in AMA and about 113 acres is within RR. The stands range from 66 to 70 years old, and are predominantly Douglas-fir with lesser amounts of western hemlock and big leaf maple, and, in riparian areas, red alder. They all originated with natural regeneration in the early 1930's after clearcut harvest. Regeneration appears to have been slow and resulted in variable stocking, ranging from small gaps dominated by shrubs, areas with open-grown trees, to areas of high density. In areas were the canopy is open, the understory and shrub layers are mostly thickets of vine maple (*Acer circinatum*) and huckleberry (*Vaccinium* sp.). In areas where the canopy is closed, the amount of vine maple and huckleberry is reduced or the areas are open and covered in duff without many forbs or shrubs present. There has been no past management. Understory trees are limited, ranging from 0 to 45 western hemlock saplings per acre.

Table 10: Current Stand Conditions and Recommended Treatments (Overstory trees only)

Unit	Age[1] (yrs)	Pre-treatment stand characteristics					Recommended post-treatment stand characteristics immediately after thinning				
		TPA[2]	BA[3] (sq ft)	QMD (in)[4]	RDI[5]	CR[6]	TPA[2]	BA[3] (sq ft)	QMD (in)[4]	RDI[5]	CR[6]
409	66	92	275	24	.69	0.38	47	160	25	.39	.41
410	66	88	253	23	.65	0.45	32.5	170	31	.38	.56
411	70	96	238	21	.67	0.48	35	160	29	.37	.48
Avg.	**67**	**92**	**255**	**23**	**.67**	**0.44**	**38**	**163**	**28**	**0.38**	**.48**

1: Total stand age - 2005 data.
2: Number of trees per acre.
3: Basal area per acre.
4: Quadratic mean diameter, diameter at breast height (4.5 feet) of tree of average basal area.
5: Proportion 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.
6: Crown ratio is the amount of live crown in relation to total tree height. Greater crown ratio generally indicates greater tree health and vigor. (Average crown ratio is much less than those of dominant trees.)

Stand Development

Stand development conditions are similar as described in the Affected Environment for Project 1.

Forest Health

Forest health conditions are as described above in the Affected Environment for Project 1.

Coarse Woody Debris

The amount of CWD in the proposed treatment area averages 405 cubic feet per acre. Overall, approximately 32 percent of the total CWD is from down wood, and 68 percent is from snags. Though the CWD is not abundant, over half of it is in the 'hard' decay classes (class 1 and 2), resulting from recent tree mortality and wind throw. However, abundant CWD resulting from wind throw does occur along the south and west edges of the project area totaling about 4 acres, where recent harvests on

private land have occurred. There are 10 conifer snags per acre in the project area, with an overall average of 22 inches DBHOB.

Table 11: Potter Creek Coarse Woody Debris

Part A. Current CWD conditions[1]						
Unit	CWD Volume[2]		Snags per Acre by Size Class[3]			
	CF/acre	% DC1+2	7-10"	11-19"	20"+	Total
409	400	41	0	0.63	2.43	3.06
410	783	43	3.86	1.40	3.84	9.10
411	32	73	4.25	8.30	4.53	17.08
Part B. Proposed CWD Prescriptions						
Proposed Unit	Prescription Objective[4]					
All Units	Monitor the stands for snags and CWD and create appropriate levels when stands reach 80 years, according to best scientific information and RMP objectives.					

1) CWD data comes from stand exam surveys where down logs were counted along transects and the number of standing snags were counted at fixed plots.
2) Down log volume is reported in cubic-feet per acre, and the percent of that volume that exists in hard decay classes (decay class 1 and 2).
3) Snags are reported in size classes based on DBHOB.
4) The general goal is to balance both long-term and short-term needs for CWD by adding some new material now and to let residual trees grow larger for future CWD recruitment.

Threatened/Endangered and Special Status Botanical and Fungal Species
Inventory of the project area for Federal and Oregon State T&E and Bureau SS vascular plant, lichen, bryophyte, and fungal species were accomplished through intuitive controlled surveys, in accordance with survey protocols for the specific groups of species.

One known site of the Bureau SS 'tracking' [ONHIC (Oregon Natural Heritage Information Center) list 4] lichen species *Platismatia lacunosa* and one known site of the Bureau SS 'tracking' (ONHIC list 4) vascular plant species, 'Loose-flowered bluegrass' (*Poa laxiflora*) were found within riparian areas during surveys. There are no other "known sites" of any T&E or Bureau SS vascular plant, lichen, bryophyte or fungi species within the project area nor were any found during subsequent surveys.

Invasive/Non-Native Plant Species (including Noxious Weeds)
The following noxious weeds are known from within or adjacent to the project area, Tansy ragwort (*Senecio jacobaea*), bull and Canadian thistles (*Cirsium vulgare* and *C. arvense*), St. John 's wort (Hypericum perforatum), and Scot's broom (*Cytisus scoparius*).

Environmental Effects

4.6.1.1 Alternative 1 (No Action)

Natural disturbance agents such as disease, insects, and wind would create stand structural diversity. 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 treatment were implemented.

Stand Structure
Stand structural conditions would remain on the current trajectory of high and increasing density. Understory development would be limited: few new understory trees would establish, and existing understory trees would die or slow in growth due to increasing competition. Disturbance events and endemic levels of insects and disease would not be expected to result in accelerated development with any degree of certainty. Inputs from *Phellinus weirii*, an endemic root disease, and wind throw would continue, and events may result in more numerous snags or downed logs due to higher stand density. In general, the quantity of trees dying is expected to be greater than if the stands were thinned, but dead trees would be smaller DBHOB. The main input of CWD would come from such events, and from density mortality. Without treatment, density mortality would continually increase. Eventually, dominant trees would shade out and kill suppressed and co-dominant trees. This would create additional snags and CWD.

Crown ratios would decrease as the canopy closes. Wind firmness and individual tree stability would also decrease. The canopy in this stand would remain closed for several decades. The number and diversity of understory and shrubs/forbs species in dense canopy areas may remain low.

Forest Health
There would be no short-term elevated risk of bark beetle infestation resulting from harvest and CWD creation, but risk of substantial wind throw that could trigger bark beetle infestation would exist. Blowdown trees may occur in winter storms creating habitat for the Douglas-fir bark beetle. As openings in the canopy are created, additional sunlight would be available to the understory, shrubs and forbs. Additional openings may increase the number and diversity of "botanical and fungal" species in the area. Openings may become dominated by shrubs (salal) and/or ferns.

There would be no reduction in canopy density and consequently no microclimatic changes in the Riparian Reserves.

This alternative does not meet the objectives for speeding development of late-successional forest habitat.

Threatened/Endangered and Special Status Botanical and Fungal Species
The known site of the Bureau tracking lichen species, *Platismatia lacunosa* and vascular plant species, *Poa laxiflora* would not be affected.

Invasive/Non-Native Plant Species (including Noxious Weeds)
Without any new human caused disturbances in the proposed project area, the established noxious weed populations would remain low.

4.6.1.2 Alternative 2 (Proposed Action)

All existing vegetation in the forested areas where roads are to be constructed, renovated, or reconstructed would be scraped to mineral soil to facilitate roadwork. These areas would be heavily compacted through the road building and logging operations. Timber falling and yarding operations would also disrupt areas of duff and expose mineral soil, especially in yarding corridors.

The stands consist of an overstory and sparse understory widely separated in age and size. Thinning to the recommended density (averaging 38 TPA), is expected to put the stands on a

trajectory toward development of some late-seral forest conditions, and yield an estimated 3,750 thousand board feet over the 170-acre treatment area.

Stand Development
The proposed action would decrease the existing coniferous canopy cover through thinning. The more open canopy resulting from thinning would allow for an increased amount of sunlight to reach the understory and forest floor species (shrubs, forbs, ferns, and graminiods) and cause ground level microclimatic changes such as increased maximum temperatures, lower minimum humidity, and increased wind speed. These effects adjacent to streams would be reduced by SPZs. The increase in sunlight may allow these species to increase in density. Many open slash covered areas could become dominated by shrub and/or fern species. Sunlight would also be increased to the lower parts of the canopy, which may increase the growth rate to the reserved conifers. Future tree growth would result in recovery of canopy, by as much as 4 to 6 percent cover annually. Understory establishment and growth would contribute to canopy cover as well.

On the average, the recommended levels of thinning would increase both understory and overstory tree diameter growth, increase crown length, width, and branch size, promote stand stability, and result in a greater level of understory development than would occur without thinning. Thinning would target Douglas-fir, increasing the relative proportion of the other tree species.

Currently height to diameter ratios (calculated from the QMD and the height of the 40 largest TPA) of the Potter Creek stands average 58. Values of 80 or less are considered fairly stable, the lower the number the more stable. Without thinning, the ratio would continue to increase to a predicted (ORGANON model) less stable average of 79.

The predicted average growth increase in QMD for overstory trees as a result of density management thinning for all units averages 6.5 inches, from a post-treatment unit average of 28 inches immediately following treatment, to an average of 34.5 inches after 30 years of growth. Without thinning, the average increase in QMD is predicted to be 5.1 inches. Density management would result in an additional 1.4 inches of diameter growth in 30 years, a 20 percent increase from no treatment.

Forest Health
The stems of the severed conifers would be removed from the project area while their tops, branches, and broken/shattered stems remain on site to decay. Some of the broken stems and larger diameter tops would provide short-term habitat for the Douglas-fir bark beetle. In the unlikely event of a large infestation of these beetles, some reserved Douglas-fir trees may be killed in the 1 to 5 years following. Subsequent infestations are not likely after approximately 5 years. Blown down timber may also lead to an increase in the Douglas-fir bark beetle populations.

If standing trees were killed, it would create snags that are valuable for wildlife. Blown down timber may also occur post harvest in the thinned areas creating additional CWD. Inputs would be of large diameter, created from average size of residual stand, and of decay class 1 material that is currently very limited (except along the western edge of the project area). Potential future treatments to create downed logs and snags would increase the number of snags and downed log volumes.

The potential for wind throw from winter storms would be higher following density management. The greatest risk of wind throw after density management would be in portions of the stand where density is currently very high. Risk is also greater near created openings (clearcuts on adjacent private lands), and where aspect (the lee side of ridges from prevailing winds) and topography

increase risk. Wind throw is not expected to reduce tree density by more than 20 percent for the first decade after treatment over the treated area.

Damage to Residual Trees
Skyline, ground-based and helicopter yarding systems would result in minor damage to 2 to 8 percent of the residual trees. Prescribed burning of slash piles along roads and on landings could result in damage to the crowns of a few adjacent residual trees.

Effects on stand development and the Attainment of Aquatic Conservation Strategy Objectives from density management within the RR
Desirable habitat for aquatic and riparian dependant species within the treated RR would be enhanced or maintained through: 1) maintenance of stand health and stability, 2) long-term increase in quality LWD recruitment, and 3) maintenance of stream temperature through shading.

Habitat to support well distributed riparian-dependent and associated species would be maintained by the density management. Treatment would result in characteristics such as large diameter trees with deep, wide crowns and large limbs, understory developing at mid-canopy and ground levels, and large diameter snags and CWD. Such a habitat would support diverse populations of plants, invertebrates, and vertebrates.

Stream shading would not be affected by the proposed treatment in areas where the SPZ widths are greater than 50 feet because thinning would occur outside the primary shade zone. Additionally, topographic shading occurs where small streams have steep side slopes.

Threatened/Endangered and Special Status Botanical and Fungal Species
Bureau Tracking species, *Poa laxiflora* and *Platismatia lacunosa* known sites would be protected because they are located within SPZs. This project would not directly affect any other T&E or Bureau SS vascular plant, lichen, bryophyte or fungi species since there are no known sites within the project area or adjacent to the project.

This project could affect any species that are not practical to survey for and known sites were not located during subsequent surveys. These species would mainly include Bureau SS fungi species. However, the majority of these species have no known sites within the Marys Peak RA or the Northern Oregon Coast Range Mountains.

Invasive/Non-Native Plant Species (including Noxious Weeds)
Any ground disturbing activity may lead to an increase in the noxious weeds known from within the project area. All road construction, reconstruction, renovation, decommissioning, timber falling, and yarding operations would disrupt areas of duff and expose mineral soil. Non-native species may become established in any exposed mineral soil areas. In western Oregon, many non-native species often persist for several years but soon decline as native vegetation increases within the project areas. However, some species can persist for long periods.

This project would comply with the Marys Peak Integrated Non-Native Plant Management Plan. The risk rating for the long-term establishment of noxious weed species and consequences of adverse effects on this project area is low and adverse effects from noxious weeds within the project area are not anticipated for the following reasons: The project design feature of reestablishing vegetation on exposed soil areas by sowing with Oregon Certified (blue tagged) red fescue (*Festuca rubra*), and/or sowing with a wildlife vegetation mix and applied at a rate equal to 40 pounds per acre or sowing/planting with other native species as approved by the resource area botanists are expected to minimize the establishment of noxious weeds.

4.6.2 Soils

(IDT Reports incorporated by reference: McFall/Potter Creek Density Management Fuels and Soils Report, pp. 1-22)

Affected Environment

The predominant soils in the project area are Bohannon gravelly loam and Astoria clay loam. A less predominant soil found in some of the riparian areas is Knappa silt loam.

The major management concern with the Bohannon and Astoria soils is the sensitivity to compaction when moist or wet and its subsequent reduction in infiltration rate when compacted. On steeper sites (greater than 25 percent) run off rates and hazard of erosion can be high for bare soil. The areas of Knappa soils are all within riparian areas and for the most part would not be disturbed.

Environmental Effects

4.6.2.1 Alternative 1 (No Action)

This alternative would result in no change to the affected environment. Short-term impacts to soils would be avoided.

4.6.2.2 Alternative 2 (Proposed Action)

Compaction and disturbance/displacement of soil

Following completion of this proposed action, the majority of vegetation and root systems would remain, along with surface soil litter and slash from thinned trees. Expected amounts of surface soil displacement, surface erosion, and dry ravel resulting from commercial thinning operations should be minimal in the skyline and helicopter yarding areas. Some additional soil displacement and compaction can be expected in the ground-based yarding area, but overall the aerial extent and degree would remain well below the established district guidelines (10 percent or less).

Road Work

Constructing 1,568 feet of new road would result in loss of top soil and compaction of sub-soil on approximately 0.8 acres of forested land and convert it to non-forest, (about 0.5 percent of the total project area). Reconstructing 265 feet of existing road would result in approximately 0.2 acres of current non-forest land, (about 0.2 percent of the total project area), to remain in a non-forested condition.

Landings

For all of the landings, a portion of the existing haul road or the harvest road is used for equipment to operate on. Some additional ground adjacent to the road surface is 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 is 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. Most of this would occur on existing road surfaces.

Two new landings are proposed for use for the helicopter yarding portion of the project. The landing area is estimated to be less than 1½ acres total for the 2 landings; at least ¼-acre of this area would be existing road surface. Landings for the aerial logging would comprise approximately 0.7 percent of the total project area.

Skyline Yarding
The estimated 7 landing sites are needed for the skyline yarding. About half of the surface area used for landings is existing road surface. The additional area adjacent to the road that would be needed for landing area is estimated to be approximately 800 square feet per landing. For the entire proposed project area, this amounts to 0.1 acres.

Skyline yarding corridors would affect about 3 percent of the skyline area or approximately 0.9 acres. Impacts usually result in light compaction of a narrow strip less than four feet in width. No measurable long-term effects on site productivity are expected from this type and amount of disturbance.

Ground-based Yarding
For ground-based yarding, impacts would vary depending on how dry the soils are when heavy equipment operates on them and how deeply covered with slash the soils in the skid trails are. Impacts also include the additional area used for landings. For all of the landings, the additional adjacent ground would mostly be used to sort and deck logs until transport. Two landings would be used for ground-based yarding. The active portion of landings would have similar amounts of displacement and compaction as tractor skid trails. Areas where logs are decked would have minimal disturbance.

In tractor skid trails, expect a moderate amount of top soil displacement and moderate to heavy soil compaction to occur depending on the amount of use. For the entire ground-based area (37 acres), the percentage of area impacted by surface disturbance and soil compaction is approximately 6 to 9 percent (approximately 2.2 to 3.3 acres). Expect a moderate to heavy degree of soil compaction and a moderate amount of top soil displacement to occur in skid trails and at landings.

Helicopter Yarding
With the exception of the landings described above, no negative effects on soils in expected from helicopter yarding since logs are lifted free of the ground for transport to the landing.

The total (new and existing) area of impacted ground from all yarding activity under this project proposal is expected to be well below the 10 percent district guideline for aerial extent of soil impacts listed in the Salem District RMP.

Site Productivity
Any disturbance of these soils would not be expected to substantially affect long-term productivity of the site but may lead to some short-term effects to vegetation composition and/or water quality. Knappa soils are highly productive and any disturbance is expected to reestablish vegetation quickly.

During all yarding operations, care should be taken to minimize soil compaction and to preserve the integrity of the soil surface horizon/litter layer as much as possible. Doing this would sustain long-term site productivity and stability by maintaining the infiltration capacity, the nutrient storage and cycling, and minimizing surface water flow and erosion.

Pile Burning
Experience over three decades of burning piled slash in this area of the Oregon Coast Range has shown no reduction in site productivity on areas where piled slash has been burned. Based on this local experience, no reduction in site productivity is expected from this proposed activity.

Yarding (All Methods)
For helicopter yarding systems, no measurable reduction in overall yield for the project area is expected.

For skyline yarding systems, soil impacts in yarding corridors are expected to result in light compaction in narrow strips less than 4 feet in width. The effect on overall site productivity from light compaction on less than 1 percent of the total area is expected to be none or very low (no measurable reduction in overall yield for the project area).

For ground-based yarding plus all landings (4.2 aces) and new road construction (0.8 acres), soil impacts are expected to result in moderate to heavy, fairly continuous compaction within the landing areas and the main, less than 10 foot wide, skid trails. Impacts would be light to moderate and less continuous on less traveled portions of skid trails. Worst case, expected reduction in productivity for the 4.2 acres of landings and skid trails is a 10 to 20 percent reduction in yield on those 4.2 acres. The effect on overall project site productivity resulting from the impacted acres is expected to be less than 0.5 percent reduction in overall yield for the 170-acre project area. If the new road construction is left in place, the loss of growth on this (0.8 acres) area, added to the estimated reduction above, yields a worst case expected reduction in productivity for the total project area of approximately 1 percent for an 80-year rotation.

Effects on Soil Erosion
Observations over 3 decades of burning piled slash in this area of the Oregon Coast Range has resulted in no evidence of surface erosion from areas where piled slash has been burned. Based on this local experience, no increase in surface erosion is expected from this proposed activity.

With slash and existing undergrowth being left on nearly all of the area, no measurable amounts of surface erosion are expected from the forested lands treated under this proposed action.

Placement of waterbars and blocking off skid trails would promote out-slope drainage and prevent water from accumulating and running down the skid trail surfaces in large enough volumes to cause erosion that could reach streams. A small amount of localized erosion can be expected on some of the tractor skid trails the first year or two following yarding. Eroded soil is not expected to move very far from its source and would be diverted by the waterbars or out sloping to spread out in the vegetated areas adjacent to the trails and infiltrate into the ground. After several seasons, the accumulated litter fall on the skid trails would reduce the impact of rainfall on the soil surface further reducing the potential erosion of the skid trails.

4.6.3 Water

(IDT Reports incorporated by reference: McFall/Potter Creek Density Management Hydrology Report, pp. 1-20 & Cumulative Effects Analysis for the McFall/Potter Creek Thinning, pp. 1-6)

Affected Environment

The project area is in the Upper South Fork Siletz River seventh-field watershed. The general discussion of the affected environment is the same as found under Project 1. Individual streams are discussed below.

Project area streams
The largest streams from west to east are 1) an unnamed tributary to the South Fork Siletz River, 2) Potter Creek, and 3) McSherry Creek. These are third order streams. The unnamed tributary is a straight channel in an area that has a low slope on the west side and steeper slopes on the east. Potter

Creek is the largest creek and has the widest riparian area with cover primarily of red alder with some western red cedar and Douglas-fir. Slopes are steeper outside the riparian area. McSherry Creek has a narrow riparian area with red alder adjacent to the channel and conifers within steeper slopes on both sides of the stream. The other streams in the project area are generally small perennial or intermittent first and second order tributaries to the larger streams described above.

Project Area Water Quality

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. No quantitative turbidity data was located for this analysis.

Stream Temperature
Stream temperature data was not located for project area streams. Stream reaches in the project area were identified as having a "low" risk of temperature increases due to inadequate shading, with small reaches with a "high risk (USWA, 1996). All stream channels observed in the field appear well shaded by conifers, red alders, and brush. They are unlikely to be substantially heated due to direct solar radiation.

Beneficial Uses of Project Area Stream Flow
There are no known domestic or municipal water rights located in the project area. Additional recognized beneficial uses of stream flow in the project area include anadromous fish, resident fish, recreation, and esthetic value. Best management practices would be implemented to help eliminate and/or minimize any potential impacts to beneficial uses of the project watersheds.

Environmental Effects

4.6.3.1 Alternative 1 (No Action)

The No Action alternative would result in a continuation of the condition and trends of water resources as described under the USWA and Affected Environment of this EA. No reduction of forest canopy would take place. No additional disturbance to flow paths resulting from yarding and road work/use would occur. Streams disturbed from past management would continue to evolve towards a stable condition.

4.6.3.2 Alternative 2 (Proposed Action)

Water Quality – Fine Sediment and Temperature
Approximately 30 acres would be skyline yarded and 37 acres of ground-based yarding. Skyline yarding corridors 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.

In order to minimize soil compaction and erosion, ground-based yarding would occur during periods of low soil moisture with little or no rainfall. Even if compacted, high levels of residual slash left on yarding corridors, could reduce runoff by deflecting and redistributing overland flow laterally to areas where it would infiltrate into the soil.

Approximately 103 acres would be helicopter yarded. Helicopter yarding has limited impacts to erosion or sedimentation as the logs are suspended off the ground and do not leave a compacted trail. Slash would generally be left on site adding ground cover.

In addition, SPZs in riparian areas have high surface roughness, which can function to trap any overland flow and sediment before reaching streams.

Stream Temperature

Using the method outlined in the *Northwest Forest Plan Temperature TMDL Implementation Strategies* (USDA Forest Service, USDI BLM, Final September 2005), the shade sufficiency analysis gives the primary shade zone for the streams within Project 2 boundaries between 50 and 55 feet. All SPZs are at least as wide as the primary shade zone. Stream shading and water temperature would not be affected by this project.

Channel Morphology

This project is unlikely to affect stream channel stability and function, as most areas would be protected with at least a 50-foot SPZ. No yarding would occur across streams. No bank stabilizing vegetation would be removed. This project would remove wood that could potentially become large woody debris in the streams. However, thinning is proposed to produce larger trees over time that would fall into the streams adding additional structure and complexity to the channel.

Pile Burning

The majority of slash associated with this project would be left on site. Where large amounts of slash are located along roads and landings, it would be piled and burned. Burning piles could produce small areas without soil cover that are more susceptible to erosion. Burning could also produce patches of bare soil with altered properties that restrict infiltration. Burn piles would occupy very small areas surrounded by larger areas that would absorb runoff and trap any sediment that moved from the burn sites. The burned areas would be expected to reestablish vegetation entirely within one to two growing seasons. To protect water resources no burning would occur within SPZs to protect water resources.

Road Work

Road construction of approximately 1,568 feet at 4 sites would occur. One site is located on a slope from 0 to 5 percent. This road segment would access a ground-based yarding area and provide a helicopter landing site. This area is outside the SPZ. The other sites are all on or close to the ridge top, are not within SPZs and would have no connectivity to streams.

The other road work consists of road reconstruction of approximately 265 feet and road renovation on approximately 2 miles of road. There is potential for short-term (1-year) sediment input to streams from road construction and maintenance. However, the limited magnitude and duration of this affect would likely be insignificant for water quality on the scale of the sixth-field watershed and would be unlikely to have any effect on any designated beneficial uses

4.6.4 Fisheries/Aquatic Habitat

(IDT Reports incorporated by reference: McFall/Potter Creek Density Management Project Fisheries Report, pp. 1-23)

Affected Environment

See Affected Environment above for Project 1, EA section 3.2.4.

Environmental Effects

4.6.4.1 Alternative 1 (No Action)

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.

4.6.4.2 Alternative 2 (Proposed Action)

Yarding/Falling – Due to the small percentage of forest cover being affected and the low elevation of the proposed action, changes in stream flow are considered unlikely to be detectably (Thornton 2007). As changes in stream flows are considered undetectable at the treatment site, no effects to fish habitat is anticipated.

Based on the shade sufficiency analysis (Snook 2007), the Hydrology Report water quality analysis (Thornton 2007), and the project design features, the proposed action is unlikely to affect temperatures, thus fish habitat would also be unaffected both at the treatment site and downstream by temperature changes.

Based on the riparian stand analysis the propose action would retain trees which would reach larger diameters earlier compared to the no treatment option, creating higher quality LWD recruitment in the long-term (Snook 2007). 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 200 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 action is 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 riparian areas 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.

The proposed project actions are unlikely to result in any measurable changes in sediment delivery to the surrounding stream network that could affect the turbidity, substrate composition, or the sediment transport regimes (Thornton 2007). The dominant use of helicopter yarding, SPZs, and residual slash should keep sediment movement to a minimum. The proposed treatment is unlikely to measurably alter DO or nutrient levels. As the proposed action is not likely to measurably alter water quality characteristics at the treatment sites, they would be unlikely to affect aquatic habitat adjacent to or downstream from the project area.

Timber Hauling - Hauling can increase the risk of sediment reaching stream channels and negatively affecting aquatic habitat. The rocked haul route includes approximately 6 fish-bearing and 10 non-fish-bearing stream crossings in the Upper Siletz River watershed and approximately 20 perennial and intermittent streams, (all non-fish-bearing crossings) in the Luckiamute River watershed. All haul routes would be available for hauling year round, subject to being shut down during high precipitation events.

Luckiamute River Watershed

Based on the hydrology analysis, some sediment is expected to be generated from hauling on the road segments within the Luckiamute River watershed (Thornton 2007). However, the proposed year round hauling on rocked roads in the Luckiamute River watershed is not expected to result in detectable quantities of sedimentation reaching fish-bearing streams primarily due to the distance of stream crossings to occupied fish habitat, at least ¾ miles downstream. Sediment that may reach non-fish-bearing streams would likely be absorbed into the channels before reaching fish habitat (Duncan et al, 1987). Implementation of the recently completed road renovation work (Weyerhaeuser Company) will be expected to nearly eliminate road surface connectivity with the non-fish-bearing streams and will serve to eliminate the potential for sediment reaching downstream fish habitat due to hauling.

Upper Siletz River Watershed

The proposed year round hauling on rocked roads in the Upper Siletz River watershed may result in minor short-term increases in sediment reaching the 6 fish-bearing stream crossings and 10 non-fish-bearing streams. Due to the presence of fish-bearing crossings and the elevated risk of sediment reaching these streams, it is reasonable to expect an indirect short-term negative impact to aquatic habitat from hauling. The magnitude of sediment generated at the site levels that could reach fish-bearing streams would be minimized with application of native surface seasonal restrictions, sediment control design features (silt fences, hay bales etc…), and cessation of haul during heavy rainfall. Any sediment that would reach the stream channels from the haul route crossings would likely be absorbed into the channels, limiting the extent of fish habitat affected (Duncan et al, 1987). The duration of sediment reaching streams would be short-term (only occurring during the first wet season during and immediately following hauling activities). Where fish are present, fish would be expected to move away from crossings where sediment may be elevated and would be expected to reoccupy habitat following cessation of hauling. Site-specific effects to fish habitat downstream of the intermittent stream crossings in this watershed are not anticipated. Sediment generated from hauling over non-fish-bearing crossings within a half mile may reach fish habitat in the following wet season; however, the magnitude is expected to be undetectable against background turbidity.

Road Construction/Renovation/Reconstruction - The proposed roads are unlikely to increase drainage network in the watershed. No stream crossings would occur as part of new construction. A 300-foot segment of new construction may occur within RR; however, the new road is located on a ridge top. All new construction would be decommissioned following harvest. Thus, road construction is unlikely to increase sediment or stream flow, which may affect stream channels and affect fish.

No short-term negative effects to the recruitment potential of large wood to the headwater reaches of Potter Creek or McSherry Creek are anticipated as a result of proposed road construction. The road construction proposed in the RR of the Upper Siletz River watershed is only one segment of road construction that would occur within 210 feet from a stream channel. Roads are located mostly on or near ridge tops, outside the SPZs, and are unconnected to the stream network (Thornton 2007). The short segment of road located on the ridge, is at least 140 feet upslope from the nearest stream.

Average tree height in Potter Creek is between 60 and 100 feet (Snook 2007). As distance of the road location in the RR is greater than average tree height, effects to LWD recruitment are unlikely. Over the long-term, as the riparian stand matures the trees nearest the stream have the greatest likelihood of providing sources for LWD. The roads would be blocked and winterized following harvest and would move towards a recovered state over time. The new road

construction segments are more than 500 feet upslope from fish-bearing habitat in McSherry Creek and more than 1,000 feet upslope from fish-bearing habitat in Potter Creek. Since there is no site level effects anticipated to occur to LWD recruitment to the small intermittent streams in the project area from the proposed road construction, no effects to fish habitat are anticipated.

The proposed road renovation treatments (rocking, grading, and ditch line reconstruction) would be expected to result in a minor short-term increase in erosion in the winter following work (Thornton 2007), until reestablishment of vegetation in the subsequent growing seasons. Renovation near fish-bearing crossing may result in an indirect short-term negative impact to fish in the first winter following treatment. Most sediment related to road renovation would likely be quickly absorbed into the channel bedload (Duncan et al, 1987), minimizing the amount of sediment exposure to fish. Fish would be expected to move away from crossings where sediment may be elevated during early winter heavy rainfall events when introduction of sediment is most likely and fish would be expected to quickly reoccupy habitat as road surfaces harden. Sediment generated from non-fish-bearing crossings may reach fish habitat in the following wet season; however, the magnitude is expected to be undetectable against background turbidity. The proposed road renovation work is intended to improve drainage and road surface conditions, resulting in less erosion into the surrounding area over time.

Pile Burning – Burning piles could produce small areas susceptible to erosion and restricted infiltration (Thornton 2007). However, burn areas would be surrounded by unburned SPZs, as no burning would occur within SPZ. Slash burning with the use of these mitigating design features is not anticipated to negatively affect the aquatic environment.

4.6.5 Wildlife

(IDT Report incorporated by reference: Biological Evaluation for McFall/Potter Creek Density Management Timber Sale, pp. 1-9)

Affected Environment

See Affected Environment above for Project 1, EA section 3.2.5.

Environmental Effects

4.6.5.1 Alternative 1 (No Action)

Under the No Action alternative the thinning would not occur. The mostly uniform, single-layered mid-seral stands would continue to grow and develop into mature structure at a much slower rate then if released through thinning. Species dependent on larger and more complex structure, both live and dead, would avoid these stands for a longer period. Elk foraging opportunities would not be improved.

4.6.5.2 Alternative 2 (Proposed Action)

Project 2 is surrounded by private lands that are managed for timber production. 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. The proposed density management treatment of Project 2 is designed to accelerate the structural development of these stands into late-seral habitat. These actions would have long-term positive impacts for species dependent on interior late-seral forest habitat in the subwatershed by creating larger trees in less time.

The silviculture prescription for Project 2 would remove the suppressed, intermediate, and smaller co-dominant Douglas-fir and leave the dominant and larger co-dominant conifers. Post-treatment densities would range from approximately 32-47 TPA. 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 most of the action area. The most substantial short-term impacts, (approximately ten years) would be a simplification of overstory stand structure due to the removal of green trees along with an increase in complexity and diversity in the understory structure due to an increase in light penetration. Since there is a continuous presence of mid-seral habitat in the watershed, any short-term negative impacts to species dependent upon this type would be insignificant.

Big Game – The Valsetz Elk Herd

Forage availability is a limiting factor to the viability of the Valsetz elk herd. The proposed density management action would improve the conditions for forage availability and persistence in the watershed. Opening up the overstory canopies of the stands would allow more light to hit the forest floor, which would encourage the growth of elk forage.

Special Habitat Components

Creation of CWD in Project 2 would be deferred. The stand would be monitored for at least ten years as the stands are younger and more blowdown is expected after the thinning operation. These actions are expected to have no known negative impacts to stand composition or function, and have both immediate and long-term positive impacts for species that require complex large structure associated with the late-seral forest environment.

Special Status Species Impacts

Northern Spotted Owl: This project would degrade dispersal habitat, however, the stands are still expected to function as dispersal habitat after treatment. The long-term impact of density management on owls would be positive since the existing habitat would develop into suitable nesting habitat sooner then if left unthinned.

Marbled Murrelet: Treatment of the unsuitable mid-seral habitat would have long-term positive effects by accelerating the time it would take for these stands to develop into suitable nesting habitat.

Mollusks: None of the listed species is expected to occur within the action area, however, if any of the mollusks were found during the fall 2007 survey then potential negative impacts would be mitigated through buffering and withdrawing the site(s) from any timber harvest activity.

Special Attention Species Impacts

Red Tree Vole: The action would have a positive impact on red tree vole habitat since the vole prefers late-seral habitat and the proposed treatments would accelerate the development of these conditions within the selected stands.

Evening Field Slug: The evening field slug is not expected to be found within the action area. If any slugs were found during the fall 2007 surveys then potential negative impacts would be mitigated through buffering and withdrawing the site(s) from any timber harvest activity.

4.6.6 Fuels/Air Quality

(IDT Reports incorporated by reference: McFall/Potter Creek Density Management Fuels and Soils Report, pp. 1-22)

Affected Environment

The project area is occupied by second growth stands of 66 to 70-year-old Douglas-fir and western hemlock. The stands are generally in a fully stocked condition and have not been commercially thinned. Understory vegetation is mostly a moderate growth of sword fern, salal, and vine maple on the uplands with heavier brush near the draws. Salmonberry and red alder are common on the wetter sites. Duff ranges from ½ to 2 inches. Scattered throughout the stand are large (36-inch plus DBHOB) decayed stumps from the previous logging operation. A few large logs left from the original logging are randomly scattered through out the sites. Smaller down logs from more recent wind throw are found in localized patches and are scattered throughout the stand. Dead fuels less than 9 inches DBHOB average less than 7 tons per acre, larger fuels over 9 inches DBHOB average less than 20 tons per acre. Where there is recent blowdown the large fuel loading is up to 40 tons per acre. Large snags over 20 inches DBHOB are less than one per acre; smaller snags are abundant.

Environmental Effects

4.6.6.1 Alternative 1 (No Action)

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

4.6.6.2 Alternative 2 (Proposed Action)

Fuels

Vegetation cleared for road construction, renovation and reconstruction, would result in creation of approximately 25-35 tons of slash that would be scattered and/or piled along the right-of-ways. Most of this material would end up being piled and burned following harvest operations and some would remain scattered in and adjacent to the right-of-way. This would slightly increase the risk for a fire start along the right-of-way while the roads are in use but following completion of logging all concentrations and piles would be covered and later burned. After the project has been completed and the piles burned, the increase in fire risk would be insubstantial.

Fuel loading, risk of a fire start and the resistance to control a fire, would all increase at the project area as a result of the proposed action. Slash created from timber harvest would add an estimated 10 to 25 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, the period when needles dry out but remain attached. These highly flammable “red needles” generally fall off within one year and risk of a fire start greatly diminishes. Fire risk would continue to diminish as the area "greens up" with understory vegetation, and as the fine twigs and branches in the slash begin to break off and collect on the soil surface. 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 substantially to increased fire risk.

Depending on the amount of large down wood left on site from the logging, resistance to control would also decrease over time but more slowly. The resulting total residual dead fuel loading would vary throughout the project area ranging from 10 to 45 tons per acre. It is expected that 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.

Although not the stated purpose of this proposed action, 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, if a fire started under dry summer or early fall conditions, the increased slash loading in the thinned stands would likely result in high mortality from scorch.

Air Quality

The estimated total amount of slash debris to be piled for burning is approximately 850 tons. Burning 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 airshed. Generally, once covered dry piles have been ignited, the fire intensity builds rapidly to a point where the fuels burn cleanly and very little smoke is produced. Locally within ¼- to ½-mile of the piles, there may be some short-term smoke impacts after piles are ignited (resulting from drift smoke). Burning of slash would always be coordinated with ODF in accordance with the Oregon State Smoke Management Plan that serves to coordinate all forest burning activities on a regional scale to prevent negative impacts to local and regional airsheds.

5.0 PROJECT 3 – AQUATIC HABITAT RESTORATION

5.1 Purpose of and Need for Action

The BLM proposes aquatic habitat restoration activities on approximately ¾ of a mile of stream. These activities may include timber harvest and coarse wood creation. The land use allocation for these activities is Riparian Reserves.

McSherry Creek

The following describe the purpose for the action:

Promote the rehabilitation and protection of at-risk fish stock and their habitat (RMP p. 27) to:

- ✓ Restore and enhance activities should target summer steelhead (USWA p. 129);
- ✓ Contribute to the attainment of Aquatic Conservation Strategy objectives;
- ✓ Create spawning and rearing habitat instream structures for anadromous and resident fish (APU silviculture report p. 6).

Marys Peak RA staff performed a comprehensive, landscape level analysis to determine relative priority of watershed areas within the RA for ecosystem management. Assessments of watershed, wildlife, silviculture, transportation, and ownership conditions were made in comparison with provincial strategies to identify opportunities, needs, and their relative urgency. The proposed project area was chosen for aquatic habitat restoration (APU 2004).

Potter Creek and McSherry Creek support populations of resident cutthroat trout. The stream channels currently are deficient in LWD needed for structural habitat diversity. A primary factor that has reduced fish production in coastal basins is the loss of such instream habitat provided by LWD. Instream LWD is an essential habitat element for a number of reasons. Large woody debris creates pools and backwater areas that provide slack water refuges during high flows and rearing habitat during the summer. It also provides nutrient inputs and storage sites, and traps sediment, including gravel required for spawning (essential habitat elements).

Log structures would help to rehabilitate the stream and enhance natural populations of anadromous and resident fish by improving spawning and rearing habitat (RMP p. 27).

There is a need to:

- ✓ Rehabilitate streams and enhance natural populations of anadromous and resident fish;
- ✓ Increase LWD in Potter and McSherry Creeks;
- ✓ Increase instream habitat through log structures.

The project would be implemented within a 3-year period that could commence in 2010.

5.2 Alternative Development

Pursuant to Section 102 (2) (E) of NEPA (National Environmental Policy Act 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 identified conflicts were unresolved. Therefore, this EA would analyze the effects of the Alternative 1 (No Action) and Alternative 2 (Proposed Action).

5.3 Alternative 1 (No Action)

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

5.4 Alternative 2 (Proposed Action)

The BLM proposes to create log jams, deflector logs and scour logs within the stream channel of the Potter and McSherry Creeks. Map 5 indicates the approximate locations of the structures that would be placed.

Approximately 40 conifer trees, (along the two stream stretches), would be selected adjacent to the stream channel for felling into the stream channel. Tree selection to the extent practicable should also further silvicultural enhancement of the adjoining stands, (Project 2 of this EA). Some individual hardwood trees along the two streams and adjacent to the log placement sites may be felled to facilitate placement operations and to provide planting sites for streamside conifers. All trees would be directionally felled toward the streams and flood plains.

Log structural stability would be achieved by grouping at least two trees in conjunction with each other. It is anticipated that each tree would have lengths of at least two times the bankfull width. In general, whole trees would be incorporated into each structure.

5.4.1 Project Design Features

The following is a summary of design features that reduce the risk of effects to the affected elements of the environment.

Fisheries/Aquatic Habitat:

- ✓ Instream activities would occur during the summer period with lowest stream flow (generally July 1 to August 31), and comply with *Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources*.
- ✓ Hardwood trees felled to facilitate placement operations would be felled towards the streams and left on site.
- ✓ Follow ODFW guidelines for LWD enhancement projects.

Wildlife and Plant Habitat:

- ✓ Site management of any Bureau SS botanical and fungal species found as a result of additional inventories would be accomplished in accordance with, BLM Manual 6840- *Special Status Species Management* and the *Record of Decision, To Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines in Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl (March 2004).*
- ✓ If any additional conifer trees would be severed, the resource area botanist would survey for any federal or Oregon State T&E and Bureau SS or survey and manage species prior to cutting.
- ✓ All green trees selected for stream structure enhancement would be inspected and approved by a Resource Area Biologist to ensure that they do not currently provide nesting structure for spotted owls or marbled murrelets. No potential nest trees for red tree voles, northern spotted owls, or marbled murrelets would be felled.
- ✓ Where appropriate, disturbed areas may be planted with conifers upon project completion.

Water Resources:

- ✓ Power equipment would be refueled at least 200 feet (or as far as possible) from streams,
- ✓ Spill containment equipment would be kept on site.

Cultural:

- ✓ 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 were discovered during project work until an archaeologist can assess the significance of the discovery.

5.5 Comparison of Alternatives With Regard To Purpose and Need

Table 12: Project 3 – Comparison of Alternatives by Purpose and Need

Purpose and Need (EA section 5.1)	Proposed Action	No Action
Provide instream LWD for spawning and rearing resident cutthroat populations.	Approximately 40 pieces of LWD would be felled within Potter and McSherry Creeks. Trees would be interlocked and trap sediment, provide nutrient input and gravels for spawning and rearing.	Does not accomplish the purpose and need. Cutthroat habitat would continue to be degraded.

5.6 Affected Environment and Environmental Effects

Those elements of the human environment that were determined to be affected would be the following: *vegetation, soils, water, fisheries/aquatic habitat, and wildlife*. This section describes the current condition and trend of those affected elements, and the environmental effects of the alternatives on those elements.

5.6.1 Vegetation

(IDT Reports incorporated by reference: Botanical Report McFall/Potter Creek Density Management Project, pp. 1-15)

Affected Environment

This project occurs within the affected environment as described in Project 2. However, this project occurs only within the riparian zones along Potter Creek and McSherry Creek. Red alder (*Alnus rubra*) overstory with a shrub layer of salmonberry (*Rubus spectabilis*) and/or vine maple (*Acer circinatum*) dominate both of these creeks. The major plant grouping as listed in the Salem District Proposed Resource Management Plan/Final Environmental Impact Statement (V.1, chapter 3, pp. 29-32) is the Douglas-fir/Red Alder/Salmonberry grouping which occurs on the west slopes of the Oregon Coastal Mountains.

There are no "unique" habitat areas (caves, cliffs, meadows, waterfalls, ponds, lakes) within the proposed project area.

Threatened/Endangered and Special Status Botanical and Fungal Species
Inventory of the project area for Federal and Oregon State T&E and Bureau SS vascular plant, lichen, bryophyte, and fungal species were accomplished through intuitive controlled surveys, in accordance with survey protocols for the specific groups of species.

One known site of the Bureau SS 'tracking' (ONHIC list 4) lichen species, *Platismatia lacunosa*, and one known site of the Bureau SS 'tracking' (ONHIC list 4) vascular plant, 'Loose-flowered bluegrass' (*Poa laxiflora*), were found during surveys. There are no other known sites of any T&E or Bureau SS (vascular plant, lichen, bryophyte or fungi) species within the project area nor were any found during subsequent surveys.

Invasive/Non-Native Plant Species (including Noxious Weeds)
The following noxious weeds are known from within or adjacent to the project area, Tansy ragwort (*Senecio jacobaea*), bull and Canadian thistles (*Cirsium vulgare* and *C. arvense*), St. John 's wort (Hypericum perforatum), and Scot's broom (*Cytisus scoparius*).

Environmental Effects

5.6.1.1 Alternative 1 (No Action)

No trees would be cut and left to decay within the riparian systems of Potter and McSherry Creeks. No beetle infestations would be anticipated on the cut trees. The falling of conifers would not damage trees or shrubs within the riparian system.

Threatened/Endangered and Special Status Botanical and Fungal Species
The known site of the Bureau tracking lichen species, *Platismatia lacunosa*, and vascular plant species, *Poa laxiflora*, would not be affected.

Invasive/Non-Native Plant Species (including Noxious Weeds)
Without any new human caused disturbances in the proposed project area the established noxious weed populations would remain low.

5.6.1.2 Alternative 2 (Proposed Action)

Effect on Native Vegetation
The falling of 40 trees and leaving them would have minor additional effects when compared to the Project 2. The trees may become infested with Douglas-fir bark beetle and would have the same effects as mentioned under Project 2.

Existing riparian vegetation may be broken or smashed when the conifers are felled into the riparian areas and some forbs would be smashed or buried from the impact of the trees hitting the ground. These impacts would also be minor when compared to Project 2.

Threatened/Endangered and Special Status Botanical and Fungal Species
The *Platismatia lacunosa* known site would be protected as it occurs outside of McSherry Creek on an unnamed tributary and outside of the proposed treatment area. *Poa laxiflora* tends to become established in disturbed areas adjacent to aquatic systems. The felling of a few trees within the population of *Poa laxiflora* would not likely be detrimental to this rhizomatous Bureau tracking species. This project would not directly affect any other T&E or Bureau SS vascular plant, lichen, bryophyte or fungi species since there are no known sites within the project area or adjacent to the project.

This project could affect any species that are not practical to survey for and known sites were not located during subsequent surveys. These species would mainly include SS fungi species. However, the majority of these species have no known sites within the Marys Peak RA or the Northern Oregon Coast Range Mountains.

Invasive/Non-Native Plant Species (including Noxious Weeds)
Any ground disturbing activity may lead to an increase in the noxious weeds known from within the project area. The falling of the conifers may disrupt very small areas of duff and expose mineral soil. Non-native species may become established in any exposed mineral soil areas. In

western Oregon, many non-native species often persist for several years but soon decline as native vegetation increases within the project areas. However, some species can persist for long periods.

This project would comply with the Marys Peak Integrated Non-Native Plant Management Plan. The risk rating for the long-term establishment of noxious weed species and consequences of adverse effects on this project area is low and adverse effects from noxious weeds within the project area are not anticipated. The project design feature of reestablishing vegetation on exposed soil areas by sowing with Oregon Certified (blue tagged) red fescue (*Festuca rubra*) and/or sowing with a wildlife vegetation mix and applied at a rate equal to 40 pounds per acre or sowing/planting with other native species as approved by the resource area botanists are expected to minimize the establishment of noxious weeds.

5.6.2 Soils/Fire

(IDT Reports incorporated by reference: McFall/Potter Creek Density Management Fuels and Soils Report, pp. 1-22)

Affected Environment

The affected environment is the same as Project 2 above in section 4.6.2 and 4.6.6.

Environmental Effects

5.6.2.1 Alternative 1 (No Action)

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

5.6.2.2 Alternative 2 (Proposed Action)

Falling scattered, small groups of 2 to 4 trees is not expected to negatively affect the soil resource or long-term site productivity in the riparian area.

Due to the location, the addition of small log jams in the stream and adjacent riparian area would not affect fire risk or resistance to control to such a degree that any action would be needed to mitigate the effects.

5.6.3 Water

(IDT Reports incorporated by reference: McFall/Potter Creek Density Management Hydrology Report, pp. 1-20 & Cumulative Effects Analysis for the McFall/Potter Creek Thinning, pp. 1-6)

Affected Environment

Potter Creek and McSherry Creek are tributaries to the South Fork of the Siletz River. The riparian area of Potter Creek is broad with a high percentage of red alders. There are also western red cedars, western hemlock, and Douglas-fir within the riparian areas.

Potter Creek is a response reach within the project area. It is a low gradient stream with a wide (200- to 400-foot) riparian area dominated by hardwoods. A section of Potter Creek runs adjacent to an old roadbed.

The McSherry Creek riparian area is narrower (generally less than 100 feet) surrounded by steeper slopes vegetated by conifers. Red alder dominate the narrow riparian area. The upland forest surrounding the stream is similar to that described for Potter Creek.

Oregon Department of Fish and Wildlife surveys of Potter and McSherry Creeks in 1995 showed only 182 total pieces of wood in Potter Creek and only 12 key pieces of wood in Section 35. Eleven of the 12 were on BLM managed land. McSherry Creek had 211 pieces of wood with only 8 key pieces (ODFW 1995).

Environmental Effects

5.6.3.1 Alternative 1 (No Action)

The streams would continue to function in their current condition. The streams are low in wood and have less complexity than streams with higher amounts of wood. Over time, wood would be recruited naturally.

5.6.3.2 Alternative 2 (Proposed Action)

The proposed action would add key pieces of wood to the streams to help anchor small pieces of wood. There would be no change in flows as only a small number of trees would be cut compared to the drainage area. There could be a transient addition in sediment when the tree falls where it scrapes the bank or channel bottom. There could also be some additional sediment movement when wood moves/shifts during high flows. The amount of sediment would be within background variations and not measurable.

There are many potential benefits to stream function from adding large wood to streams. During high flows, large wood can dissipate peak flow energy and create refuge from high flows for fish. Adding wood to the streams may improve water quality by trapping fine sediment. In addition, large wood can also stabilize gravels to improve spawning areas.

Felling of approximately 40 conifers along approximately ½-mile of Potter Creek and ¼-mile of McSherry Creek is not expected to affect stream shading. The large numbers of red alders along these streams would leave them heavily shaded.

Adding large wood could improve channel complexity by adding pool habitat. Studies have shown that pools created by wood are commonly 3 times as deep as those created by gravel bars (Saldi-Caromile et al 2004). Large wood can change gradients for short stretches and sometimes add side channel habitat.

The proposed action would result in improvement in channel conditions. This stream is known to be deficient in large wood. Having some large wood would help trap smaller wood to keep it from moving too quickly through the system. Adding wood adds complexity to the present channel and improves habitat in the short-term until large wood is recruited naturally to the streams.

5.6.4 Fisheries/Aquatic Habitat

(IDT Reports incorporated by reference: McFall/Potter Creek Density Management Project Fisheries Report, pp. 1-23)

Affected Environment

See Affected Environment above for Project 1, EA section 3.2.4.

Environmental Effects

5.6.4.1 Alternative 1 (No Action)

Recruitment of LWD to the stream channels would continue at current rates, (the existing rate appears to be relatively low). Achievement of ODFW's desirable LWD benchmark (Foster et al 2001; Appendix A) would be delayed, potentially for decades, until natural recruitment occurs thru mortality of mature stands or recruitment events such as landslides and wind throw. Stream channels typically controlled by LWD structure that are inadequately stocked with wood generally result in simplified channel conditions and accelerated bed movement. Structural complexity provided by LWD increases the variety of habitat for fish across multiple age classes (Cederholm et al 1997). Thus, lack of LWD in project area streams can be assumed to negatively affect the quality of aquatic habitat for fish.

5.6.4.2 Alternative 2 (Proposed Action)

The placement of large wood in Potter Creek and McSherry Creek thru felling of conifer trees adjacent to the stream channel would both increase the amount of habitat and provide the key elements necessary to maintain that habitat. Instream work of this type is considered beneficial to both the habitat and fish populations as they respond to the improved habitat.

However, direct and indirect short-term negative impacts to fish and aquatic habitat are anticipated. The felling of standing trees into occupied habitat would directly affect resident fish, and potentially affect rearing summer steelhead. Direct effects are primarily limited to short-term disturbance of a few fish from resting/feeding habitats during instream placement. Fish would be expected to move away from the site of disturbance and would quickly return upon cessation of felling.

Indirect effects from increased stream channel scour, reduction in stream shade, and future LWD recruitment are anticipated. The placement of the wood could mobilize fine sediments locally as a result of local hydraulic changes altering bed and bank scour and deposition. With the use of design features, effects are anticipated to occur only at the site and within a short distance downstream. Sediment movement would be expected to return to background levels within the first winter after project implementation.

Forest density and shading in the SPZ adjacent to the affected streams would be left virtually unaltered under this proposal. It is anticipated that small holes in the riparian canopy (less than 10 square meters) would occur near trees that are felled. These would be dispersed along both sides of the stream banks at up to 40 sites spread over a ¾-mile section of two streams in the Upper Siletz River watershed. While this has a slight potential to increase the amount of water surface exposed to direct solar radiation, it is not expected to result in an increase in stream temperatures because the fallen trees would also provide additional shading directly over the channel and riparian canopies would quickly fill in where additional light is available. Over time, increases in the quantity of stored substrates and deepened pools may lead to a slight decrease in summer stream temperatures in the stream channels.

5.6.5 Wildlife

(IDT Report incorporated by reference: Biological Evaluation for McFall/Potter Creek Density Management Timber Sale, pp. 1-9)

Affected Environment

See Affected Environment above for Project 1, EA section 3.2.5.

Environmental Effects

5.6.5.1 Alternative 1 (No Action)

Under the No Action Alternative the creation of instream structure would not occur. Species dependent on larger and more complex structure, (both live and dead), would avoid these reaches.

5.6.5.2 Alternative 2 (Proposed Action)

Big Game – The Valsetz Elk Herd
Project 3 would have no effect on elk habitat in the action area.

Special Habitat Components
Project 3 would add some CWD to the riparian environment (approximately 40 trees over ¾-mile of stream). This action is expected to have no known negative impacts to stand composition or function, and have both immediate and long-term positive impacts for species that require complex large structure associated with the late-seral forest environment.

Special Status Species Impacts

Northern Spotted Owl: This project would degrade dispersal habitat but the stands are still expected to function as dispersal habitat after treatment.

Marbled Murrelet: Project 3 is expected to have no impact on the future nesting function of the stands due to the small number of trees to be felled into the selected stream reaches.

Mollusks: None of the listed species is expected to occur within the project area. However, if any of the mollusks were found during the Fall 2007 survey then potential negative impacts would be mitigated through buffering and withdrawing the site(s) from any timber harvest activity.

Special Attention Species Impacts

Red Tree Vole: This project will have no effect on the vole.

Evening Field Slug: The evening field slug is not expected to be found within the project area. If any slugs were found during the Fall 2007 surveys then potential negative impacts would be mitigated through buffering and withdrawing the site(s) from any timber harvest activity.

6.0 CUMULATIVE EFFECTS FOR ALL PROJECTS

6.1 Vegetation

There would be no cumulative effects to the vegetation in the Riparian Reserves, as the effects from the project would be local, and there would be no other uses affecting this resource.

6.2 Fuels/Air Quality/Soils

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 treatments. Although there would be an increase in fuel loading, because of the discontinuous arrangement and isolated location in the stream area, there would be no measurable effect on overall fire risk or resistance to control for the project site due to aquatic habitat restoration. When looked at from a watershed scale, the thinning of approximately 487 acres of forest habitat would reduce the long-term (5 or more years) potential of the stand to carry a crown fire. This results from spacing out the trees crowns and the removal of most of the ladder fuels that are conducive to the spread of fire into the tree canopies. The localized increase in fire risk would diminish down to historic back round levels within 15 years.

The Oregon State Smoke Management Plan that serves to coordinate all forest burning activities on a regional scale to protect local and regional airsheds would guide burning of slash. 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.

Yarding thinned trees by the methods proposed for this project would cause a very limited amount of compaction or displacement of soil around the landings and on the 43 acres of ground-based yarding. No statistically substantial measurable long-term reduction in overall site productivity is expected from Project 1 and approximately 1 percent or less reduction is expected in overall site productivity from Project 2, over half of that is due to the 0.8 acres of land removed from the growing base by the new road construction. Falling scattered trees across the streams would cause very localized and limited amounts of compaction or displacement of soil. At the project site level, these impacts would not be statistically substantial and therefore are considered negligible.

6.3 Water

Cumulative Effects to Peak Flows

These watersheds were initially analyzed for land ownership, vegetation type, age class, and extent of transient snow zone. In addition, miles of road and miles of road likely to intercept groundwater were calculated. The risk of increasing peak flows in the drainages was determined using the methodology of the *Salem District Watershed Cumulative Effects Analysis Procedure 1994*. The assumptions are 1) changes in vegetation composition in a watershed can effect magnitude and timing of flows as well as water yield (30 year vegetation recovery is assumed in the above document), 2) the influence of timber harvest on snow accumulation and melt can cause a measurable increase in magnitude and timing of peak flows, 3) increases in peak flows can be related to an increase in road development particularly where they intercept groundwater.

The risk of increased peak flows is low within the project area. The project area is below the Transient Snow Zone (TSZ). The vegetation in private ownership within the analytical watersheds (drainages) has been cut in the past 30 years with the majority of the acres in the 10-30 year category and presently

recovering. The project areas have a low density of roads that intercept groundwater and are considered low risk for an increase in peak flow due to road influences.

The project activities are primarily low impact thinnings. Since the proposal is not likely to result in detectable direct or indirect effects to stream flow the proposal would be unlikely to contribute to any potential cumulative effects to either annual flow, base flow, flow timing or peak flows in these watersheds. The proposal would result in no net increase in forest openings in Transient Snow Zone with crown closure <30% and therefore would not contribute cumulatively to peak flow augmentation that may be occurring in these watersheds as a result of forest harvest. Proposed road use and construction is unlikely to alter surface or subsurface hydrology or to contribute cumulatively to any change in the watershed base, peak, or annual flow.

For wet environments such as the coast range, thinned units are considered recovered to pre-thinned values with 12 years (Ager and Clifton 2005).

Cumulative Effects to Water Quality & Channel Morphology
Because most units of the proposed projects are not likely to have a direct effect on temperature or channel characteristics, they are unlikely to contribute to cumulative effects to these parameters.

The projects do have the potential to contribute cumulatively to sediment loads in streams adjacent to roads. However, the limited magnitude and duration of this affect would likely be insignificant for water quality on the scale of the seventh-field watersheds and would be unlikely to have any effect on any designated beneficial uses. This contribution to watershed sediment yields would be short-lived (primarily in the first winter following road repairs). The recent road work (Weyerhaeuser Corporation) will lower the background level of sediment inputs to streams from the Valsetz Mainline road and would lead to long-term improvements in sedimentation.

6.4 Fisheries/Aquatic Habitat

The cumulative effects of the proposed actions associated with the McFall/Potter Projects to the vegetation, hydrology, and soil resources were assessed under the Hydrology Report (Thornton 2007), Soils and Fuels Report (Tomczyk 2007), and the Silvicultural Prescriptions (Snook 2007). Combined with the direct and indirect effects analysis presented in the Fisheries Report these additional cumulative effects analyses form the basis of the fisheries resource cumulative effects analysis.

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 (Thornton 2007a) and the Hydrology Cumulative Effects Analysis (Thornton 2007b) changes in flows were considered immeasurable at the site level and are unlikely to contribute to cumulative effects, subsequently no cumulative effects are anticipated on aquatic resources.

Density Management
The majority of proposed stand treatments are not expected to alter LWD recruitment, stream bank stability, and sediment supply to channels at the fifth-field watershed scale in the short- or long-term. Based on the site level analysis, alteration of LWD recruitment potential due to the ‘thin-through’ Unit 31L and 20-foot SPZs in Units 31D and 31E, limited to McFall Creek, may occur. This small amount of affected stream in the Upper Siletz River watershed (0.1 percent) is unlikely to measurably affect the spatial or temporal recruitment patterns of LWD at the fifth-field watershed scale.

Portions of Units 31D, 31E, and 31L include treatments within 55 feet of the stream channel may result in sediment reaching stream channels, increased solar radiation reaching streams, and reduced dissolved oxygen (Thornton 2007). These effects could impair the quality of aquatic habitat at the site. The effects to fish habitat from changes in temperature and sediment are anticipated to be short-term and localized to the effected portions of McFall and Callahan Creek. These impacts could cause a short-term reduction in habitat quality of fish habitat in these stream reaches. Impacts would diminish over time (as vegetation recovers), and with distance from the treatment area. The short-term site scale nature of effects anticipated associated with these impacts are unlikely to result in measurable cumulative effects to fishery resources at a fifth-field watershed scale.

The Hydrology report indicated that the proposed treatments in Potter Creek and McFall Creek Units 31A, 31C, 31F – 31K, 31M and 31N were considered unlikely to have detectable effects on stream temperatures and not expected to result in any cumulative effects to temperature (Thornton 2007). No cumulative effects are anticipated for peak flows, stream banks, and instream structure that could affect temperature. Since no cumulative effects were anticipated for these project activities on temperature, stream bank conditions, and peak flows, these treatments would not result in cumulative effects for fisheries resources.

Road Work

Based on the project design criteria, effects from proposed road construction associated with Project 2 would be minimal within the RR. As distance of the road location in the RR is greater than average tree height, effects to LWD recruitment are unlikely. Road construction is not anticipated to effect LWD recruitment or sediment transport to streams at the site level and no cumulative affects are anticipated to instream structure or sediment regimes in Upper Siletz River watershed.

Proposed road renovation activities may result in localized sediment transmission to intermittent streams. These effects may reach fish habitat at 6 fish-bearing stream crossings causing a short-term site-specific reduction in quality of fish habitat. These impacts would be of short duration, (habitat quality would be expected to quickly recover) and would not be expected to contribute to any long-term cumulative effects.

Timber Hauling

Hauling may contribute a minor amount of sediment to the stream network during wet season hauling. Most haul routes are located near ridge tops with a limited number of stream crossings. Direct effects may occur at the 6 fish-bearing culverts as part of the proposed timber hauling. The small scale local effects that may occur due to proposed hauling are not anticipated to contribute to cumulative effects at the fifth-field level in the Upper River Siletz watershed. There is only one crossing over each affected fish-bearing stream and crossings are located on nearly flat valley gradients. The impacts are expected to be localized and not transported downstream due to modest channel gradients. A culmination of hauling impacts from multiple crossing, additively impair sediment regimes, is not anticipated thus no cumulative effects to aquatic habitat is anticipated. Hauling within the Luckiamute River watershed is at least ¾ miles upslope from fish-bearing streams, no site level impacts were anticipated and would be unlikely to cumulative effect aquatic resources.

Aquatic Habitat Restoration

The LWD treatment in Project 3 would increase the abundance of LWD in the treated reaches. Assuming all LWD project reaches are treated, (covering approximately ¾ miles of stream in the Upper Siletz River watershed), the action would enhance LWD on approximately 0.1 percent of the streams in the watershed. Local populations of fish may beneficially respond to the enhancement treatment. However, at the project scale no measurable increases in fishery productivity are anticipated, thus no cumulative effects would be anticipated.

6.5 Wildlife

There would be a positive cumulative impact in the Upper Siletz River watershed to wildlife habitat for elk and late-seral/old-growth dependent species from these projects since they are designed to enhance the conditions of the existing habitat for these species. Projects 1-3 are surrounded by private lands that would only provide early and mid-seral forest habitat under current management plans. If these private lands cannot provide late-seral forest habitat conditions then any treatments that enhance diversity and the development of late-seral characteristics would have a positive effect on species, systems, and functions in the watershed.

7.0 COMPLIANCE OF ALL PROJECTS WITH THE COMPONENTS OF THE AQUATIC CONSERVATION STRATEGY

Existing Watershed Condition

The McFall/Potter Creek Density Management/Aquatic Habitat Restoration Project areas are in the Upper Siletz River fifth-field watershed which drains into the Siletz River. Twenty-seven percent of the Upper Siletz River watershed is managed by BLM, and 73 percent is managed by private land owners. Approximately 18 percent of the total BLM managed lands consist of stands greater than 80 years old and approximately 28 percent of BLM managed lands are located in riparian areas (within 100 feet of a stream).

Review of Aquatic Conservation Strategy Compliance

I have reviewed this analysis and have determined that 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 project 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. Approximately 300 feet of new road construction would occur within RMP Riparian Reserves.

Component 2 – Key Watershed: by establishing that the McFall/Potter Creek projects are not within a key watershed.

Component 3 – Watershed Analysis: The Upper Siletz Watershed Analysis (1996) 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 these projects:

Projects 1 & 2: Conifer forests older than 80 years old comprise 3.5 percent of the acreage within 100 feet of active streams, compared to an estimated 60 percent in pre-settlement times. Evaluate other projects to promote large tree development and to develop desirable vegetative structure (p. 7).

As a result of past forest management, the timing, quantity, size of material and rate of input (water, sediment, organic material) have probably been altered in comparison to reference condition. Design new roads to reduce their width; construct new roads on ridges or flats (p. 7).

Most of the early and mid-seral habitat is deficient in snags and large, hard woody debris based on field observations. In stands with less than 400 feet of hard, downed wood per acre, cut live conifers to create this level (p. 9).

Project 3: Target riparian enhancement projects (with the objective of speeding attainment of older seral stage vegetation) along response reaches, particularly in the South Fork Siletz River subwatershed. Suitable hardwood stands (i.e., stands with a high potential for conversion to conifers) should be considered for underplanting with appropriate conifer species following removal of some overstory in patches (p. 126).

Placement of woody debris, creation of snag, or planting of conifers and riparian species would be used where appropriate to restore riparian conditions (p. 126); and

Component 4 – Watershed Restoration:

Project 1: McFall Creek Density Management – Over the long-term, this project should aid in meeting ACS Objectives by speeding the development of older forest characteristics in RR, including increased large wood recruitment for stream channels. In addition, stands that are more open would allow for the growth of important riparian species in the understory.

Project 2: Potter Creek Density Management – Over the long-term, this project should aid in meeting ACS Objectives by speeding the development of older forest characteristics in RR, including increased large wood recruitment for stream channels. In addition, stands that are more open would allow for the growth of important riparian species in the understory.

Project 3: Aquatic Habitat Restoration – Over the long-term, this project should increase spawning and rearing habitat for resident cutthroat. In addition, the input of large woody debris would improve connectivity of aquatic terrestrial species and ecosystem functioning.

In addition, I have reviewed these projects 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 13: Projects' Consistency with the Nine Aquatic Conservation Strategy Objectives

Aquatic Conservation Strategy Objectives (ACSO)	**Project 1 – McFall Creek Density Management** (EA section 2.0)	**Project 2 – Potter Creek Density Management** (EA section 4.0)	**Project 3 – Aquatic Habitat Restoration** (EA section 5.0)
1. Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features.	Does not prevent the attainment of **ACSO 1**. Treating RR to increase species vigor, diversity, and CWD would help restore the distribution and complexity of landscape features in the watershed.	Does not prevent the attainment of **ACSO 1**. Treating RR to increase species vigor, diversity, and CWD would help restore the distribution and complexity of landscape features in the watershed.	Does not prevent the attainment of **ACSO 1**. The addition of LWD into Potter Creek and McSherry Creek would help to restore the diversity and complexity of watershed features to which native aquatic and riparian species are uniquely adapted. Current levels of LWD are severely depleted compared to historic ("natural") conditions
2. Maintain and restore spatial and temporal connectivity within and between watersheds.	Does not prevent the attainment of **ACSO 2**. Long-term connectivity of terrestrial watershed features would be improved by increasing the availability and proximity of functioning riparian habitat.	Does not prevent the attainment of **ACSO 2**. Long-term connectivity of terrestrial watershed features would be improved by increasing the availability and proximity of functioning riparian habitat.	Does not prevent the attainment of **ACSO 2**. The spatial connectivity within the watershed would be restored by providing an unobstructed physical route (habitat) to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species. The project would restore temporal connectivity in the watershed by restoring a more natural streamflow regime.
3. Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.	Does not prevent the attainment of **ACSO 3**. Stream protection zones adjacent to all surface water would maintain the physical integrity of the aquatic system. Harvest of streamside trees in unit 31L could increase the risks of impacting this objective; however, project design features such as leaving tree boles within the bankfull area and aerial yarding with vertical lift of logs near stream channels is expected to maintain the shoreline, bank, and bottom configuration.	Does not prevent the attainment of **ACSO 3**. Stream protection zones adjacent to all surface water would maintain the physical integrity of the aquatic system.	Does not prevent the attainment of **ACSO 3**. LWD placements along Potter Creek and McSherry Creek would enhance variability in stream flow velocities. This in turn would help restore the physical integrity of the aquatic system by causing sediment deposition in some areas and sediment scour in others (including banks, floodplains, and the stream bed).
4. Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems.	Does not prevent the attainment of **ACSO 4**. Except for Unit 31L, no measurable effects to water quality would be anticipated from the proposed action. Treatment in unit 31L is anticipated to result in a loss of canopy cover which could lead to an increase to solar radiation. Given the orientation of the	Does not prevent the attainment of **ACSO 4**. No measurable effects to water quality would be anticipated from the proposed action. Stream protection zones and project design features would minimize any potential contaminants from reaching water bodies (including fine sediments, fire retardant, & herbicides).	Does not prevent the attainment of **ACSO 4**. By shading the stream from solar radiation, log structures could reduce stream temperatures, thereby maintaining and restoring water quality conditions necessary to support healthy aquatic ecosystems. Regulating stream temperatures would benefit the survival,

Aquatic Conservation Strategy Objectives (ACSO)	Project 1 – McFall Creek Density Management (EA section 2.0)	Project 2 – Potter Creek Density Management (EA section 4.0)	Project 3 – Aquatic Habitat Restoration (EA section 5.0)
	stream, and the stream entrenchment documented during the field review, only minor reductions in shading are anticipated. The effect would diminish over time as the remaining stand fills in canopy openings and increases stream shade. Changes in stream temperature would be documented by stream temperature monitoring associated with the study Riparian Buffer and Density Management Study and contribute to improving project design features for future riparian thinning actions. Stream protection zones and project design features would minimize any potential contaminants from reaching water bodies (including fine sediments, fire retardant, & herbicides).		growth, reproduction, and migration of the aquatic community.
5. Maintain and restore the sediment regime under which aquatic ecosystems evolved.	Does not prevent the attainment of **ACSO 5**. The proposed 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, burning, and road-related activities from reaching water bodies.	Does not prevent the attainment of **ACSO 5**. The proposed 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, burning, and road-related activities from reaching water bodies.	Does not prevent the attainment of **ACSO 5**. Log structures would trap gravels and other substrate materials, thereby restoring the stream's sediment regime; includes the timing, volume, rate and character of sediment input, storage, and transport.
6. Maintain and restore instream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing.	Does not prevent the attainment of **ACSO 6**. The proposed alternative would not measurably alter instream flows. The proposed timber harvest would affect only 0.5 percent of the current forest cover in the watershed – well below the 20 percent threshold for measurable effects.	Does not prevent the attainment of **ACSO 6**. The proposed alternative would not measurably alter instream flows. The proposed timber harvest would affect only 0.5 percent of the current forest cover in the watershed – well below the 20 percent threshold for measurable effects.	Does not prevent the attainment of **ACSO 6**. By altering stream flows, structures would maintain and restore in-stream flows sufficient to create and sustain riparian and aquatic habitats and to retain patterns of sediment, nutrient, and wood routing (the movement of woody debris through the aquatic system).
7. Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.	Does not prevent the attainment of **ACSO 7**. Project design features, such as SPZ, coupled with the small percentage of vegetation proposed for removal, would maintain groundwater levels and	Does not prevent the attainment of **ACSO 7**. Project design features, such as SPZ, coupled with the small percentage of vegetation proposed for removal, would maintain groundwater levels and floodplain	Does not prevent the attainment of **ACSO 7**. The presence of LWD structures is likely to increase the frequency, and possibly the duration of floodplain inundation, as well as promote floodplain

Aquatic Conservation Strategy Objectives (ACSO)	**Project 1 – McFall Creek Density Management** (EA section 2.0)	**Project 2 – Potter Creek Density Management** (EA section 4.0)	**Project 3 – Aquatic Habitat Restoration** (EA section 5.0)
	floodplain inundation rates.	inundation rates.	development.
8. Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands.	Does not prevent the attainment of **ACSO 8**. Vegetation management within the RR would help restore structural diversity.	Does not prevent the attainment of **ACSO 8**. Vegetation management within the RR would help restore structural diversity.	Does not prevent the attainment of **ACSO 8**. LWD placement is not likely to greatly affect riparian plant species diversity or composition, as the amount of riparian vegetation disturbed (during project implementation) would be very small.
9. Maintain and restore habitat to support well distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.	Does not prevent the attainment of **ACSO 9**. Density management would help restore RR habitat by increasing species and structural diversity, increasing snags and CWD.	Does not prevent the attainment of **ACSO 9**. Density management would help restore RR habitat by increasing species and structural diversity, increasing snags and CWD.	Does not prevent the attainment of **ACSO 9**. LWD structures would provide additional habitat for populations of native invertebrate and vertebrate riparian-dependent species.

8.0 LIST OF PREPARERS

Table 14: List of Preparers

Resource	Name	Initial	Date
Cultural Resources	Dave Calver		
Botany TES and Special Status Plant Species	Ron Exeter	RE	Nov 19, 2007
Fisheries/Aquatic Habitat	Scott Snedaker		
Fuels/Air Quality/Soils	Tom Tomczyk	TST	Nov 19, 2007
Hydrology/Water Quality	Carol Thornton		
NEPA	Gary Humbard	GbH	11/19/07
Recreation/Rural Interface/Visuals	Traci Meredith	TMM	11/19/07
Silviculture/Riparian Ecology	Hugh Snook	HWS	11/19/07
Wildlife TES and Special Status Animal Species	Gary Licata		11/19/07

9.0 CONTACTS AND CONSULTATION

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

United States Fish and Wildlife Service (USFWS)
To address concerns for 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 the *Biological Assessment, Fiscal years 2007/2008 Habitat Modification Activities in the North Coast Province Which Might Affect Bald Eagles, Northern Spotted Owls or Marble Murrelets* (August 1, 2006). A letter of concurrence was issued by the US Fish and Wildlife Service based upon the information provided in the biological assessment (FWS reference #1-7-06-I-0190). The resulting Biological Opinion concluded that this action would not result in jeopardy to listed species and would not adversely modify critical habitat for any species. This proposed action has been designed to incorporate all appropriate design standards set forth in the Biological Assessment to ensure compliance with the Terms and Conditions included within the Biological Opinion.

National Marine Fisheries Service
The proposed actions associated with the McFall-Potter Density Management Projects are not expected to cause any effects to the listed fish or listed critical habitat in the Luckiamute River watershed. A determination has been made that the proposed projects would have 'no effect' on UWR steelhead trout. This 'no effect' determination is based on the location of the density management treatments in the Upper Siletz River watershed were no listed fish reside and distance of the haul route from ESA listed fish habitat in the Luckiamute River watershed (no closer than 0.75 miles). Due to the "no effect" determination, this project was not consulted upon with the NMFS.

Protection of EFH as described by the Magnuson/Stevens Fisheries Conservation and Management Act and consultation with NOAA NMFS is required for all projects that may adversely affect EFH of Chinook and Coho Salmon. The proposed McFall/Potter Projects 1, 2, and 3 are not expected to adversely affect EFH due to distance of all activities associated with the projects from occupied habitat in either the Upper Siletz River or the Luckiamute River watersheds. Consultation with NOAA NMFS on EFH is not required for these projects.

9.2 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 were discovered during project work until an archaeologist can assess the significance of the discovery.

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

- ✓ A scoping letter, dated June 29, 2006, was sent to 42 potentially affected and/or interested individuals, groups, and agencies. Two responses were received during the scoping period and are addressed in EA section 10.2.

- ✓ A description of the project was included in the June, September, December 2006, and March, June, September 2007 project updates to solicit comments on the proposed projects.

9.3.1 EA public comment period

- ✓ The EA and FONSI would be made available for public review November 28, 2007 to December 27, 2007. The notice for public comment would be published in a legal notice by the *Polk County Itemizer Observer* newspaper. Comments received by the Marys Peak RA of the Salem District Office, 1717 Fabry Road SE, Salem, Oregon 97306, on or before December 27, 2007 will be considered in making the final decisions for this project.

10.0 MAJOR SOURCES AND APPENDIXES

10.1 Major Sources

10.1.1 Interdisciplinary Team Reports

Exeter, R. 2007. Botanical Report. Marys Peak Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Licata, G. 2007. Biological Evaluation. Marys Peak Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Thornton, C. 2007. McFall/Potter Creek Density Management Hydrology Report. Marys Peak Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Thornton, C. 2007. Cumulative Effects Analysis for McFall/Potter Creek Thinning-Methods and Assumptions. Marys Peak Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Meredith, T. 2007. Recreation/VRM/Rural Interface Evaluation for McFall/Potter Creek Density Management Timber Sale. Marys Peak Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Snedaker, S. 2007. McFall/Potter Creek Density Management Project Environmental Assessment Fisheries. Marys Peak Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Snook, H. 2007. Silviculture Prescription McFall Creek Project. Marys Peak Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Snook, H. 2007. Silviculture Prescription Potter Creek Project. Marys Peak Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Tomczyk, T. 2007. McFall/Potter Creek Density Management Fuels and Soils Report. Marys Peak Resource Area, Salem District, Bureau of Land Management. Salem, OR.

10.1.2 Additional References

Oregon Department of Fish and Wildlife. 2000. Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources. Oregon Department of Fish and Wildlife State Office, Salem, OR.

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&G are collectively referred to herein as the Northwest Forest Plan (NWFP)

USDA Forest Service, USDI Bureau of Land Management. 1997. Northern Coast Range Adaptive Management Area Guide. Salem, OR.

USDA Forest Service, USDI Bureau of Land Management. 1998. Late-Successional Reserve Assessment for Oregon's Northern Coast Range Adaptive Management Area (Late-Successional Reserve RO269, RO270 & RO807). Salem, OR. **Note:** Referred to as NCAMA.

USDA Forest Service, USDI Bureau of Land Management. 2000. Delineation and Management of Reserve Pair Areas within Oregon's Northern Coast Range Adaptive Management Area. Salem, OR.

USDA Forest Service, USDI Bureau of Land Management. 2004. Record of Decision to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines in Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl. Portland, OR.

USDA Forest Service and USDI Bureau of Land Management. 2006. Biological Assessment, Fiscal years 2007/2008 Habitat Modification Activities in the North Coast Province Which Might Affect Bald Eagles, Northern Spotted Owls or Marble Murrelets.

USDC National Marine Fisheries Service (NMFS) 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.

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

USDI Bureau of Land Management. 1992. Final Record of Decision for Western Oregon Program Management of Competing Vegetation. Final Record of Decision. USDI, BLM, Oregon State Office, Portland, OR.

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, OR. Internal document.

USDI Bureau of Land Management. 1995. Salem District Record of Decision and Resource Management Plan. Salem, OR.

USDI Bureau of Land Management. 1996. Environmental Analysis and Finding of No Significant Impact for Callahan Creek Adaptive Management project. Marys Peak Resource Area, Salem District. Salem, OR.

USDI Bureau of Land Management. 1996. Upper Siletz Watershed Analysis. Salem, OR.

USDI Fish and Wildlife Service. 2006. Biological Opinion for Effects to Northern Spotted Owls and Marbled Murrelets from the North Coast Province Fiscal Year 2007-2008 activities that have the potential to adversely affect, due to habitat modification and disturbance, U.S. Department of the Interior; Bureau of Land Management, Eugene District and Salem District, and the U.S. Department of Agriculture; Siuslaw National Forest. Oregon Fish and Wildlife Office, Portland, Oregon. Tracking Number: 1-7-2006-F-0192 (dated 10/16/2006), Unpublished Document.

10.2 Appendix 1 – Response to Scoping Comments

A scoping letter, dated June 29, 2006, was sent to 42 potentially affected and/or interested individuals, groups, and agencies. Two responses were received during the scoping period.

10.2.1 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.

10.2.1.1 American Forest Resource Council (July 5, 2006)

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 8.0, Table 14, come to a consensus on what alternative to pursue for analysis. Alternatives

2. **Comment**: *"The AFRC would prefer to have units not tied to a specific harvesting system, instead specify what the end result of the unit should be…and allow the purchaser to select the most appropriate harvesting system to achieve the goals of the BLM."*

   Response: Harvesting systems are based Best Management Practices (RMP Appendix C-1) design features. These design features are intended to maintain or improve water quality and soil productivity, and prevent or mitigate adverse impacts while meeting other resource objectives. The purchaser has the discretion to choose the type of equipment for various harvesting systems.

3. **Comment:** *"Traditional harvesting systems (Ground-Based or Skyline Yarding) should be used when possible to achieve an economically viable sale and increase the revenues to the government. Aerial yarding is extremely costly and should only be used in situations where unique environmental concerns render conventional logging systems not an option."*

   Response: McFall Creek project contains units that are part of the research occurring at the Callahan Creek Riparian Buffer and Sand Creek Rethinning Study sites. Harvesting systems previously used within those research units would remain the same throughout the life of the treatments of those stands. An alternative considered but not fully analyzed in detail included 3,100 feet of new road construction to access 43 acres. Those acres are now planned for helicopter yarding to help achieve an economically viable sale.

4. **Comment:** *"The AFRC would like for sales to allow winter harvesting on improved roads or allow for roads to be improved so winter harvesting can be accomplished."*

   Response: Programmatic consultation with National Oceanic and Atmospheric Administration and National Marine Fisheries Service resulted in a specific list of activities that would not require any further consultation if specific design features were met. Winter

harvesting would require extensive consultation with design features that may increase cost such as applying rock to a private road to allow winter haul.

5. **Comment:** *"The AFRC would also like to suggest the use of small patch cuts to provide early successional habitat for species such as Columbian black-tailed deer and Roosevelt Elk."*

   Response: The McFall/Potter Creek project area is surrounded by private clearcuts that provide the needed habitat. The area is also part of a cooperative road closure area for elk. McFall Creek project has 4 patch cuts include in the non-research portions. See map 3.

10.2.1.2 Oregon Natural Resource Council (July 24, 2006)

1. **Comment:** *"In McFall Creek project, we are curious about what prescriptions will be used…what harvest prescriptions were used in the first round of thinning within the study areas? What were the results? What are the research goals and objectives for the area, and how do they fit in with the overall guidance for managing the forest in this area?"*

   Response: These projects are located in an Adaptive Management Area, which tests different treatments for management practices. For a reference please read the BLM Density Management and Riparian Buffer Study: Establishment Report and Study Plan for a history and future on the Callahan and Sand Creek portions of McFall Creek.

2. **Comment:** *"We understand that you are working with the PNW Research Station on a new research unit. But we must question your proposal to harvest the non-research portion of the 100 year old forest. Has this unit been previously managed? If not, we ask that you seek out a younger, previously managed stand with commercial value-where thinning will go farther to help develop a healthy, diverse late-successional stand…"*

   Response: Adaptive Management Area lands allows for thinning in stands up to the 110-year age class (106 to 115 years) to create and maintain late-successional forest conditions (RMP p. 20). Trees in the non-research areas (Units 31I, 31J, and 31M) are younger than 80 years and would grow faster and larger than non-thinned areas. These stands have had no previous management and would further research objectives by providing a comparison of silvicultural practices.

3. **Comment:** *"Thinning should be done using variable density prescriptions."*

   Response: Variability in thinning is not a major component of McFall Creek project, because the designs center around residual densities expressed in trees per acre, and it is difficult to achieve standard stocking while also creating fine and mid-scale stocking diversity. In non-research units, variability will be achieved at a larger scale, by creating early seral habitat in small patch cuts of 1.5-2.0 acres in size and small un-thinned clumps and stream buffers.

   An objective of the treatments is to maintain the current diameter distributions or trees of all diameter classes. Treatments are also designed to allow growing space for establishment of understory conifer or growth for existing understory trees.

4. **Comment:** *"In Potter Creek project, we urge you to use variable density thinning prescriptions. Though not in an LSR, the forest is older and can provide good habitat. VDT will work with the other projects proposed in this area – coarse woody debris creation, instream fish enhancement, and wet meadow enhancement."*

Response: Silvicultural objectives are to maintain existing variability in stand density by removing a proportion of the basal area, so that areas of low density will be thinned to a relatively low density, and areas of higher density will remain above average density.

5. **Comment:** *"In the McFall Creek project, we commend you for decommissioning the three spur roads that will no longer be needed. Will these roads first be reconstructed and reused as part of the project? Or will this simply be closed?"*

   Response: The three spur roads and any other road in the McFall Creek sale are planned to be renovated. Renovation is work done to an existing road that restores it to its original design standard. It may include blading and shaping of a roadway, clearing brush, cleaning or replacing culverts and applying spot rock. The three spur roads no longer needed in McFall Creek would be in effect decommissioned by gates located near the Valsetz Mainline Road.

6. **Comment:** *"In the Potter Creek project, we are concerned about the amount of new roads proposed…Is there a way to accomplish the thinning without building all these new roads? Please consider a way of doing so."*

   Response: New road construction is limited to 1568 feet down from approximately 2 miles. Helicopter yarding would substantially reduce the amount of new road construction needed to access the same acreage.

7. **Comment:** *"Also, we're curious about the road 8-8-35 which follows Potter Creek…Would this road benefit from being permanently decommissioned? …Is it in a stable state, or is it contributing sediment to the creek?"*

   Response: The 8-8-35 road is currently in a non-drivable state. A portion of Potter Creek is rerouted along this road. Decommissioning it would cause more damage to fisheries and water quality. The road would be decommissioned through natural processes reducing the risk to fisheries and water quality.

8. **Comment:** "*We feel that temporary road construction is more appropriate than permanent road construction, temporary roads still channelize water, cause erosion, and conduct invasive weeds" "ONRC believes it is possible for BLM to conduct young stand thinning without extensive construction of new roads."*

   Response: Logging systems were reviewed on both McFall and Potter Creek sales for economic feasibility and volume. Much of the acreage is now being helicopter yarded instead of building a road. McFall Creek alternative considered but not analyzed in detail (EA Section 2.6) included building 3,100 feet of road to access Unit 31I in addition to skyline yarding 4 acres across Sand Creek. All new road construction would be decommissioned following harvest operations.

9. **Comment:** *"The BLM should do an analysis that illuminates how many acres of thinning are reached by each road segment so that we can distinguish between short segments of spur that allow access to large areas…and long spurs that access small areas…In the EA, please provide a stand by stand description of the road spur lengths and the acres each spur accesses for thinning."*

Response: The majority of the new construction consists of short spur roads and they would provide the ability to treat an appropriate amount of area. The following table includes the length of each new road to be constructed and the number of acres accessed by each road and the computed cost to 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	0.07	15	228
P2	New	0.14	11	78
P3	New	0.02	3	180
P4	New	0.07	28	385

10. **Comment:** *"Be sure that this project complies with 2001 Survey and Manage guidelines. Special status species surveys must be completed prior to developing NEPA alternatives and before the decision is determined…it appears that some of the project MAY be within a critical habitat unit for the Northern spotted owl. If this is the case, all activities must benefit owl habitat and chances of survival. Be sure to disclose any impacts on spotted owls and their habitat."*

    Response: Projects would be in accordance with, BLM Manual 6840- *Special Status Species Management* and the *Record of Decision, To Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines in Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (March 2004). The projects are not within critical habitat for the Northern Spotted Owl. Specialist survey results are used to formulate alternatives and exclude acreages.

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

    Response: See Table 13 for an analysis by project on the ACS objectives.

12. **Comment:** *"A full range of alternatives should be considered for this sale. These alternatives should include wildlife enhancement, restoration, and no road building."*

    Response: All projects include a discussion between specialists regarding alternative ways to accomplish the purpose and need that drives a particular project. The specialists for the McFall/Potter Creek EA discussed road building, acreages that were not feasible and a wildlife project that dropped out because current habitat conditions are desirable. An alternative considered but not analyzed in detail is explained in Section 2.6.

10.3 Appendix 2 – McFall/Potter Creek Marking Guides

10.3.1 McFall Creek Project –Research Units

Unit Summary

Unit #	Total Acres (est.)	Current			Leave TPA[1]	CWD + Snag[2] Per Ac	Total Leave TPA	Leave Spacing (Feet)	% of Overstory Tree Cut[3]	Est. Leave BA
		TPA (7"+)	BA	QMD						
31C	46	45	157	20.9	30	7	**37**	**34**	18%	130
31D 31E 31F 31G 31H 31K 31N	9 54 16 10 24 35 1	80	239	21.5	30	7	**37**	**34**	54%	120
31L	30	130	303	16.0	60	7	**67**	**26**	48%	190

1: Leave Trees Per Acre: remaining overstory trees (greater than 9-inch DBHOB) after thinning.
2: Coarse Woody Debris and Snag Creation: 2 green trees/acre of approx. avg. DBHOB for CWD. Incidentally felled trees left by harvest operations and existing class 1 and 2 logs would be counted. Snag levels would be monitored post-sale and created to meet 5 large snags per acre.
3: Percentage of overstory trees to Remove: Given as a rough estimate of what proportion to remove. Round to nearest 10 percent and think of it as a ratio: e.g. 18 percent approximates 20 percent = remove 1 of every 5 overstory trees.

Goals

Maintain or increase the diversity of stand structure and composition while reducing density:

- Maintain the full range of diameter distribution.
- Allow for a range of tree structures, diverse crown sizes, and damaged or deformed trees.
- Increase the proportion of minor species: focus the removal on the dominant species.

Hierarchy (Priorities)

1. Meet target number of trees per acre greater than 9-inch DBHOB, selecting for best crown ratios.
2. Retain "unique" trees–wolfy, remnant/legacy trees, broken-top, forked, deep crowns.
3. Retain minor species: All hardwoods retained and do NOT count toward TPA targets. Exception: Unit 31L, see below. Most WH (western hemlock) retained and count toward TPA targets. Thin WH where it occurs in dense patches.
4. Retain existing diameter distribution by keeping trees in all size classes. Harvest trees would be primarily co-dominants. Take dominants only as necessary to meet target TPA or to release a desired minor species tree.
5. Meet residual tree spacing. Small gaps/clumps OK. Do not adjust marking near existing gaps.

Required leave trees for all units

- All snags. Protect high-value snags by marking leave trees near them.
- All Trees less than 9-inch DBHOB.
- All remnants from the previous stand.
- All tree improvement parent trees. Marked with orange "T" and yellow metal signs.

Specific Unit Guidelines

31C: Maintaining diameter distribution very important. Quadratic Mean Diameter of removal about 21". Retain existing spacing variability. Release understory DF (Douglas-fir). Retain research plot center trees (blazed in red).

31L: Leave 10 TPA in the 9 to 15-inch DBHOB range; then mark to thin "from below" (Leave 33% of trees<18"dbh, 50%>18"dbh). Where red alder is the major species, reduce from 70% to 44% cover by thinning to 54 trees per acre, leaving largest alder with fullest crowns, and all DF and WH.

10.3.2 McFall Creek Project – Non-Research Units

Unit Summary

Unit #	Total Acres (est.)	Current			Leave TPA[1]	CWD + Snag[2] Per Ac	Total Leave TPA	Leave Tree Spacing (Feet)	% of Overstory Tree Cut[3]	Est. Leave BA
		TPA (7"+)	BA	QMD						
31A	14	47	142	19.0	20	7	**27**	**40**	42%	80
31M	18	122	276	20.4	60	7	**67**	**26**	44%	190
31I 31J	41 17	76	275	25.8	30 30	7 7	**37**	**34**	51%	180

1: Leave Trees Per Acre: remaining overstory trees (greater than 7-inch DBHOB) after thinning.
2: Coarse Woody Debris and Snag Creation: 2 green trees/acre of approx. avg. DBHOB for CWD. Incidentally felled trees left by harvest operations and existing class 1 and 2 logs would be counted. Snag levels would be monitored post-sale and created to meet 5 large snags per acre.
3: Percentage of overstory trees to Remove: Given as a rough estimate of what proportion to remove. Round to nearest 10 percent and think of it as a ratio: e.g. 42 percent approximates 40 percent = remove 2 of every 5 overstory trees.

Goals

Maintain or increase the diversity of stand structure and composition while reducing density:

- Maintain a range of diameter distribution.
- Retain a range of tree structures, including diverse crown sizes, and damaged /deformed trees.
- Increase the proportion of minor species.
- Develop patches of high quality early seral habitat and leave a few small clumps unthinned.

Hierarchy (Priority)

1. Meet target number of trees per acre or greater than7" DBHOB, selecting for best crown ratios. Thin from below leaving 2 to 5 TPA small (7 to 16-inch DBHOB) trees with best crown ratios.
2. Retain "unique" trees–wolfy, remnant/legacy trees, broken-top, forked, deep crowns.
3. Retain minor species. All hardwoods retained and do NOT count toward TPA targets. Retain most WH retained and count toward TPA targets. Thin WH where abundant and overstocked.
4. Meet residual tree spacing.

Required leave trees for all units

- All snags. Protect high-value snags by marking leave trees near them.
- All tree improvement parent trees. Marked with orange "T" and yellow metal signs.

Other guidelines

- **Patch cuts:** Unit 31M and 31J: two patch cuts each would be created, 1.5 and 2.0 acres in size. In Unit 31I, one patch cut of 1.5 acres. Leave 12 to 14 trees per acre of largest diameters available. (3 to 5 green trees per acre, 4 trees per acre for CWD creation, and 5 trees per acre for snag creation).
- **Clumps:** Leave 1 clump of 5 to 15 unthinned trees each 2 to 3 acres. Center clumps in existing dense clumps, around snags, or groups of WH.

10.3.3 Potter Creek Project

Unit Summary (all statistics are for trees > 5" DBH)

Stand/ Species	Unit #	Total Acres (est.)	Current			Overall Avg. Leave BA (ft^2)	Min. & Max. BA Per Plot[1]	Leave TPA[2]	% of Overstory Tree Cut[3]	Comments
			TPA (5"+)	BA	QMD					
409	35A	30								
DF			71	260	26	**145**		26.1	64%	
WH			21	15	12	**15 (all)**		20.5	0%	Retain all WH
Total			92	275	24	**160**	**100-200**	46.7	50%	
410	35A	65								
DF			80	230	23	**147**		24.6	70%	
WH			8	23	23	**23 (all)**		7.8	0%	Retain all WH
Total			88	253	23	**170**	**100-200**	32.4	63%	
411	35A	75								
DF			45	167	26	**120**		20.6	54%	
WH			51	71	16	**40**		14.1	72%	Sanitize mistletoe
Total			96	238	21	**160**	**100-200**	34.7	64%	
		170								

1: Basal Area Range: Minimum and maximum basal area per species and total, per sampling plot. Maximum basal area may be exceeded for snag protection.
2: Leave Trees Per Acre: estimated remaining overstory trees (>7"dbh) after thinning.
3: Percentage of overstory trees to Remove: Given as a rough estimate of what proportion to remove. Round to nearest 10 percent and think of it as a ratio: e.g. 64 percent approximates 60 percent = remove 3 of every 5 overstory trees.

Boundaries
Exterior unit boundaries are marked by orange paint and Boundary Timber Reserve posters. Boundaries between marking units/stands will be designated with orange flagging.

Goals
Maintain the diversity of stand structure and composition while reducing density:

1. Meet target average basal area above. Thin from below leaving healthy trees with best crown ratios. Mark Douglas-fir (DF) and western hemlock (WH) to leave with orange paint. Other tree species and snags are reserved and will not be marked to leave.

2. Retain "unique" trees – mark average or larger sized trees (based on DBH) to leave that are wolfy crowns, remnant/legacy trees, broken-top, forked, deep crowns, evidence of wildlife use, or visible nests.

3. Retain minor species. All hardwoods reserved and do NOT count toward BA targets. Retain some (stand 411) or all (stand 409 and 410) WH, and count them toward BA targets. In Unit 411, thin WH from below, retaining trees with least mistletoe infection.

4. Maintain a range of diameters and a range of densities

5. Conifers on road cut slope or top of the cut slope that are unstable (pistol-butted trees, trees with excessive lean toward the road, etc.) that are likely to fall toward the road shall not be marked for retention.

Required leave trees for all units

- All snags. Protect snags greater than 20 inches DBHOB and greater than 40 feet high by marking all trees adjacent to them.
- All tree improvement parent trees. Marked with orange "T" and yellow metal signs.
- All hardwoods and do not mark or count them for BA.
- Trees less than seven inches and do not mark or count them for BA. Cut extra trees around under-story conifers.

Variable Basal Area

Mark in a variable-spaced manner to the average post-treatment basal area level shown in Unit Summary table above. The basal area levels for individual plots shall vary within the limits shown as long as the specified overall average basal area target level is attained within ±10 percent. Retain fewer trees where trees are further spaced and more trees where trees are tightly spaced to accentuate the existing variability already present in the unit.

10.4 Appendix 3 – Instruction Memorandum OR-2005-083 Dated August 12, 2005

United States Department of the Interior
BUREAU OF LAND MANAGEMENT
Oregon State Office
P.O. Box 2965
Portland, Oregon 97208

TAKE PRIDE IN AMERICA

In Reply Refer to:
5610 (OR-933) P

August 12, 2005

EMS TRANSMISSION 08/16/2005
Instruction Memorandum No. OR-2005-083
Expires: 9/30/2006

To: District Managers: Coos Bay, Eugene, Roseburg, Salem

From: State Director, Oregon/Washington

Subject: Density Management Studies

Purpose: This Instruction Memorandum provides direction for the next phase of the Density Management and Riparian Buffer Study (DMS).

Policy/Action: To begin out-year planning to implement the next phase of the DMS according to the revised DMS Study Plan. The DMS Site Coordinator for each site should work with the local field manager and employees responsible for the necessary contract work to ensure that this schedule can be met and to resolve difficulties. The DMS Study Coordinator should be kept informed and involved as necessary to help keep necessary actions on schedule.

Timeframe: The schedule for on-the-ground treatment implementation is as follows:

Site Name	District	Implementation Year	Site Coordinator
Bottomline	Eugene	2009	Peter O'Toole/Shami Premdas
OM Hubbard	Roseburg	2009	Craig Kintop
Keel Mountain	Salem	2009	Charley Thompson
Sand Creek	Salem	2009	Hugh Snook
Callahan Creek	Salem	2009	Hugh Snook
North Soup	Coos Bay	2010	Frank Price
Little Wolf	Roseburg	2010	Craig Kintop
Blue Retro	Coos Bay	2010	Frank Price
Green Peak	Salem	2011	Hugh Snook
Ten High	Eugene	2011	Peter O'Toole/Shami Premdas
Delph Creek	Salem	2011	Charley Thompson
Perkins Creek	Eugene	2011	Peter O'Toole/Shami Premdas

NOTE: Implementation year means the year that the activity happens on the ground. Every effort should be made to ensure the DMS units are treated in the one-year window assigned above.

Budget Impact: Funding to support contract development and implementation for the next round of treatments will come out of normal operating budgets, and achievements will contribute to normal accomplishment reporting. The Study Coordinator and other individuals in the State Office are evaluating the feasibility of funding post-treatment monitoring through contract receipts, either through stewardship contracting and/or use of the 5900 forest health funds. Additional funding of post-treatment monitoring may be needed and will be funded out of 6320, 6334, and/or 6310 subactivities, as has been the case for the last 10 years. Total funding needs for post-treatment monitoring will range from $100,000 to $300,000 annually depending on scheduling and partner funding contributions. Partner contributions have exceeded Bureau of Land Management (BLM) study funding to date.

Background: Initial direction to implement the DMS was provided through two State Office directives (Instruction Memorandum OR-93-145, Information Bulletin OR-94-317) over ten years ago. Since then, treatments implementing the study have been completed, over a thousand plots have been established, measurements for a wide variety of responses have been conducted, initial results have been reported, and a wide range of outreach and education activities have been conducted on DMS sites or with DMS information. Several manuscripts officially reporting five-year post-treatment results are scheduled for publication within the year. A strong partnership among Pacific Northwest Research Station, Oregon State University, US Geological Survey, and the BLM has supported these accomplishments.

An extensive effort was made over the past year to develop a revised DMS Study Plan (Cissel et al. in review) to address key information needs of the BLM. Proposal development steps included:

- DMS scientists and site coordinators developed initial ideas for the revised study plan and reviewed proposals in the field
- Revised study plan was reviewed and discussed with a wide range of field practitioners and managers at the DMS Workshop and Field Trips in June, 2004
- The DMS Study Coordinator reviewed the proposal with affected field managers
- Revised study plan proposal was distributed to westside field units for review
- Revised proposal was reviewed and approved by the interagency DMS Steering Committee (includes BLM district manager and branch chief)

The BLM State Office leadership and Pacific Northwest Research Station Leadership Team were briefed and concurred on study plans and direction.

Manual/Handbook Sections Affected: None

Coordination: Development of these instructions was coordinated with District Management, DMS Coordinators, and OR-930 Management and staff.

Contact: Contact the DMS Study Coordinator John Cissel, at (541) 683-6410 with questions, or for a copy of the revised study plan.

Districts with Unions are reminded to notify their unions of this Instruction Memorandum and satisfy any bargaining obligations before implementation. Your servicing Human Resources Office or Labor Relations Specialist can provide you assistance in this matter.

Signed by
Kathy Eaton
Acting Associate Director

Authenticated by
Mary O'Leary
Management Assistant

10.5 Appendix 4 – Regional Ecosystem Office Memorandum Dated May 12, 2003

Regional Ecosystem Office

333 SW 1st P.O. Box 3623
Portland, Oregon 97208-3623
Website: www.reo.gov E-Mail: REOmail@or.blm.gov
Phone: 503-808-2165 FAX: 503-808-2163

Memorandum

Date: **May 12, 2003**

To: Regional Interagency Executive Committee (See Attached Distribution List)

From: Anne Badgley, Executive Director /s/Anne Badgley

Subject: Assessment and Review of Proposed Research under the Northwest Forest Plan

Purpose: The purpose of this memorandum is to clarify implementation of certain Northwest Forest Plan (NWFP) provisions regarding research assessments and reviews.

Background: In 2001, the Regional Ecosystem Office (REO) received questions from field offices asking whether REO review of new proposed research is required. The REO prepared findings to clarify two aspects of the research questions:

1. Reviews. When is REO review of research required?
2. Assessments. Who assesses new research proposals and what factors should be considered?

This memorandum is based on interagency discussions (which included participation by research agency representatives) and review of NWFP provisions. Key NWFP provisions are attached and referenced below.

Findings: Reviews. The NWFP Standards and Guidelines (S&Gs) distinguish between ongoing and proposed research (S&Gs, pp. C-4, 18, 19 & 38). Project summaries of ongoing research, i.e., current, funded, agency approved research, were to be submitted to REO for review within 180 days after the date the NWFP Record of Decision (ROD) was signed (April 13, 1994). New research, i.e., research proposed after the NWFP was signed, does not require REO, Research and Monitoring Group (RMG), or Regional Interagency Executive Committee (RIEC) review. However, agencies may request REO or RMG assistance in conducting science reviews of new proposed research, particularly where independent, regional-scale, or interagency analysis is indicated. Requests should be submitted through the agency's RIEC executive to the REO Executive Director.

Assessments. The S&Gs (pp. C-4, 18 & 38) require that research be assessed to determine if it is consistent with the objectives of the standards and guidelines. The appropriate land manager is responsible for assessing proposed research and has discretion regarding how to conduct the assessment and documentation process. For example, the assessment and documentation may be completed in conjunction with the NEPA process.

The ROD states that, where appropriate, some research activities may be exempted from the standards and guidelines (ROD, p.15). The S&Gs further provide for this by indicating that some activities not otherwise consistent with the objectives of the standards and guidelines may be appropriate (S&Gs, pp. C-4, 18 & 38), particularly if the activities:

- Will test critical assumptions of these standards and guidelines;
- Will produce results important for habitat development; or
- If the activities represent continuation of long-term research.

In addition, the S&Gs (p. C-4) state that every effort should be made to locate non-conforming activities in land allocations where they will have the least effect upon the objectives of the standards and guidelines. (Language specific to Late-Successional Reserves (LSRs) and Riparian Reserves (RRs) is provided in the S&Gs (pp. C-18 & 38)). This factor should be considered and documented during the assessment.

The land manager is responsible for identifying any proposed research activities that are inconsistent with the objectives of the standards and guidelines, for assessing whether the activities are appropriate, and for ensuring that appropriate efforts have been made to locate non-conforming activities in land allocations where they will have the least effect upon the objectives of the standards and guidelines. The land manager may then exempt research activities from the standards and guidelines where appropriate. All research activities must meet the requirements of applicable federal laws (ROD, p.15), including the Endangered Species Act, NEPA, etc.

Related Considerations: The REO identified other factors that may be helpful to ensure scientific credibility of proposed research (a basic principle of the NWFP). These factors are not specified in the NWFP, however, land managers may consider them if appropriate during design and assessment of new research proposals, particularly proposals which include activities inconsistent with the objectives of the standards and guidelines. Optional factors that may be appropriate to consider include:

1. The extent to which the proposed research represents credible science. The following questions may be helpful in evaluating whether the proposed research represents credible science:
    - What hypotheses will be tested by the proposed research, and how are they linked to assumptions or uncertainties in the S&Gs?
    - Is the proposed study design adequate to test the stated hypotheses?
    - What are the temporal and spatial zones of inference for the proposed research?
    - Has the proposal been the subject of an independent science review? If so, what are the results?
2. The potential of the research to contribute to scientific knowledge of importance beyond the local area.
3. The potential to modify the research proposal to make it more consistent with the objectives of the standards and guidelines.
4. The extent to which the desired results could be obtained if the research was modified to conform to the standards and guidelines.

This memorandum is intended for use as the basis for responding to future inquiries regarding research assessments and reviews. All RIEC executives are encouraged to distribute this memorandum to appropriate individuals in their agency. If you have comments or need additional information, please contact me at 503-808-2165, or your REO representative.

cc: REO/RMG reps
Ken Denton (FS)
John Cissel (BLM)

1819final.doc/kc

Attachment: NWFP Excerpts Related to Research Assessments and Reviews (2 pp.)

NWFP Excerpts Related to Research Assessments and Reviews

This enclosure provides excerpts from the Northwest Forest Plan Record of Decision (ROD) and Standards and Guidelines (S&Gs) which are referenced in the accompanying memorandum on research assessments and reviews.

ROD, p. 15:
"An important component of this decision is the facilitation of research activities to gather information and test hypotheses in a range of environmental conditions. Although research activities are among the primary purposes of adaptive management areas and experimental forests, this decision does not intend to limit research activities to these land allocations. Where appropriate, some research activities may be exempted from the standards and guidelines of this decision. However, every effort should be made to locate non-conforming activities in land allocations where they will have the least adverse effect upon the objectives of the applicable standards and guidelines. All research activities must meet the requirements of applicable federal laws, including the Endangered Species Act."

S&Gs, p. C-4:
"A variety of wildlife and other research activities may be ongoing and proposed in all land allocations. These activities must be assessed to determine if they are consistent with the objectives of these standards and guidelines. Some activities (including those within experimental forests) not otherwise consistent with the objectives may be appropriate, particularly if the activities will test critical assumptions of these standards and guidelines, will produce results important for habitat development, or if the activities represent continuation of long-term research. Every effort should be made to locate non-conforming activities in land allocations where they will have the least adverse effect upon the objectives of these standards and guidelines.

Current, funded, agency-approved research that meets the above criteria, is assumed to continue if analysis ensures that a significant risk to Aquatic Conservation Strategy objectives does not exist. Research Stations and other Forest Service and BLM units will, within 180 days of the signing of the Record of Decision, submit a brief project summary to the Regional Ecosystem Office of ongoing research projects that are potentially inconsistent with other standards and guidelines in this document but are expected to continue under the above research exception. The Regional Ecosystem Office may choose to more formally review specific projects, and may recommend to the Regional Interagency Executive Committee modification, up to and including cancellation, of those projects that have an unacceptable risk [to] the objectives of these standards and guidelines."

S&Gs, pp. C-18,19:
"A variety of wildlife and other research activities may be ongoing and proposed in late-successional habitat. These activities must be assessed to determine if they are consistent with Late-Successional Reserve objectives. Some activities (including those within experimental forests) not otherwise consistent with the objectives may be appropriate, particularly if the activities will test critical assumptions of these standards and guidelines, will produce results important for habitat development, or if the activities represent continuation of long-term research. These activities should only be considered if there are no equivalent opportunities outside Late-Successional Reserves.

Current, funded, agency-approved research that meets the above criteria is assumed to continue if analysis ensures that a significant risk to Aquatic Conservation Strategy objectives does not exist. Research Stations and other Forest Service and BLM units will, within 180 days of the signing of the Record of Decision for these standards and guidelines, submit a brief project summary to the Regional Ecosystem Office of ongoing research projects that are potentially inconsistent with other standards and guidelines of this document, but are expected to continue under the above research exception. The Regional Ecosystem Office may choose to more formally review specific projects, and may recommend to the Regional Interagency Executive Committee modification, up to and including cancellation, of those projects having an unacceptable risk to Late-Successional Reserve objectives."

S&Gs, p. C-38:
RS-1. A variety of research activities may be ongoing and proposed in Key Watersheds and Riparian Reserves. These activities must be analyzed to ensure that significant risk to the watershed values does not exist. If significant risk is present and cannot be mitigated, study sites must be relocated. Some activities not otherwise consistent with the objectives may be appropriate, particularly if the activities will test critical assumptions of these standards and guidelines; will produce results important for establishing or accelerating vegetation and structural characteristics for maintaining or restoring aquatic and riparian ecosystems; or the activities represent continuation of long-term research. These activities should be considered only if there are no equivalent opportunities outside of Key Watersheds and Riparian Reserves.

RS-2. Current, funded, agency-approved research, which meets the above criteria, is assumed to continue if analysis ensures that a significant risk to Aquatic Conservation Strategy objectives does not exist. Research Stations and other Forest Service and BLM units will, within 180 days of the signing of the Record of Decision adopting these standards and guidelines, submit a brief project summary to the Regional Ecosystem Office of ongoing research projects that are potentially inconsistent with other standards and guidelines but are expected to continue under the above research exception. The Regional Ecosystem Office may choose to more formally review specific projects, and may recommend to the Regional Interagency Executive Committee modification, up to and including cancellation, of those projects having an unacceptable risk to Key Watersheds and Riparian Reserves. Risk will be considered within the context of the Aquatic Conservation Strategy objectives."

S&Gs, pp. D-7, 8:
"Monitoring and research, with careful experimental design, will be conducted in Adaptive Management Areas. Research in forest ecology and management as well as social, biological, and earth sciences may be conducted. Each Adaptive Management Area will have an interdisciplinary technical advisory panel that will provide advice to managers and the local communities involved with this effort. The technical advisory panels will provide advice and information on the appropriateness of the project.

Direction and review are provided by the Regional Interagency Executive Committee, through the Regional Ecosystem Office. This review will help assure that plans and projects developed for the various Adaptive Management Areas will be both scientifically and ecologically credible. It will assure that new, innovative approaches are used, that the laws and the goals of the plan are met, and that validation monitoring is incorporated."

S&Gs pp. E-17, 18:
"The Research and Monitoring Committee will review and evaluate ongoing research; develop a research plan to address critical natural resource issues; address biological, social, economic, and adaptive management research topics; and develop and review scientifically credible, cost efficient monitoring plans; and facilitate scientific review of proposed changes to the standards and guidelines."