Revised Upper and Lower Alsea River Watershed Restoration Environmental Assessment and Finding of No Additional Significant Impact

Environmental Assessment Number OR-080-08-08

April 5, 2010

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

Responsible Agency:	USDI - Bureau of Land Management
Responsible Official:	Trish Wilson, Field Manager Marys Peak Resource Area 1717 Fabry Road SE Salem, OR 97306 or (503) 315-5969
For further information, contact:	Gary Humbard, Project Lead Marys Peak Resource Area 1717 Fabry Road SE Salem, OR 97306 (503) 315-5981

Abstract: This revised environmental assessment (EA) discloses the predicted environmental effects of two projects on BLM managed land located in Township 14 South, Range 7 West, Sections 1, 11, 12, 19, 30 and 31, Township 13 South, Range 7 West, Sections 17 and 19; Township 14 South, Range 8 West, Sections 25 and 26 and Township 13 South, Range 8 West, Section 7 Willamette Meridian and within the Upper Alsea River and Lower Alsea River Watersheds.

- Project 1 is a proposal to perform mid-seral enhancement on approximately 768 acres of LSR (Late Successional Reserve) and RR (Riparian Reserve) LUAs (land use allocations).
- Project 2 is a proposal to restore late successional habitat in LSR and RR LUAs through the release and establishment of conifers within approximately 42 acres of 42 year-old hardwood dominated stands.

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

BLM/OR/WA/AE-08/060+1792

FINDING OF NO SIGNIFICANT IMPACT

Introduction

The Bureau of Land Management (BLM) published the *Upper and Lower Alsea River Watershed Restoration Environmental Assessment (*EA) (EA# OR080-08-08) in July of 2009. Comments received on the EA were reviewed and as a result, the BLM revised the *Upper and Lower Alsea River Watershed Restoration EA*. The *Upper and Lower Alsea River Watershed Restoration Revised EA* is attached to and incorporated by reference in this Finding of No Additional Significant Impact determination (FONASI).

The analysis in this revised EA is site-specific and supplements analyses found in the *Salem District Proposed Resource Management Plan/Final Environmental Impact Statement,* September 1994 (RMP/FEIS). The proposed density management and conifer release activities have been designed to conform to the *Salem District Record of Decision and Resource Management Plan*, May 1995 (RMP) and related documents which direct and provide the legal framework for management of BLM lands within the Salem District (*EA Section 1.3*). Consultation with the U.S. Fish and Wildlife Service and National Marine Fisheries Service is described in Section 7.1 of the revised EA.

These projects are on BLM-managed lands in Township 14 South, Range 7 West, Sections 1, 11, 12, 19, 30 and 31, Township 13 South, Range 7 West, Sections 17 and 19; Township 14 South, Range 8 West, Sections 25 and 26 and Township 13 South, Range 8 West, Section 7 Willamette Meridian and within the Upper Alsea River and Lower Alsea River Watersheds. The proposed actions are to perform mid-seral enhancement on approximately 768 acres and to restore late successional habitat through the release and establishment of conifers within approximately 42 acres of 42 year-old hardwood dominated stands. Approximately 609 of these acres are in the LSR (Late Successional Reserve) land use allocation (LUA) and 201 in the Riparian Reserve LUA.

The revised EA and FONASI will be made available for public review from April 4, 2010 to April 19, 2010. The notice for public comment will be published in a legal notice in the *Gazette-Times* newspaper. Written comments should be addressed to Trish Wilson, Field Manager, Marys Peak Resource Area, 1717 Fabry Road S., Salem, Oregon 97306. Emailed comments may be sent to OR_Salem_Mail@blm.gov. Attention: Trish Wilson.

Finding of No Significant Impact

Based upon review of the Revised Upper and Lower Alsea River Watershed Restoration EA and supporting documents, I have determined that the proposed action is not a major federal action 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 action have been analyzed within the context of the Upper Alsea River and Lower Alsea River 5th-field Watersheds. The proposed action would occur on approximately 810 acres of BLM LSR and RR LUA land,

encompassing less than 0.1 percent of the forest cover within the Upper Alsea River Watershed and less than 0.5 percent of the forest cover within the Lower Alsea River Watershed [40 CFR 1508.27(a)].

Intensity:

1. The resources potentially affected by the proposed thinning activities are: *vegetation, wildlife, soils, water, fisheries/aquatic habitat, fuels/air quality and recreation/visual resources/rural interface* . The effects of mid-seral enhancement and conifer release are unlikely to have significant adverse impacts on these resources [40 CFR 1508.27(b) (1)] for the following reasons:

   Project design features described in *(EA section 2.2.2)* would reduce the risk of effects to affected resources to be within RMP standards and guidelines within the effects described in the RMP/EIS.

- Vegetation and Forest Stand Characteristics *(EA section 3.1.1):* 1/ No special status (SS) vascular plant, lichens, bryophytes or fungi species would be affected.

  Noxious Weeds - While the number of plants may increase in the short term, any increase that does occur should be short lived because all large areas with ground disturbing activities would be grass seeded with Oregon Certified (blue tagged) red fescue (*Festuca rubra*) as a rate equal to 40 pounds per acre or sown/planted with other native species as approved by the resource area botanist. Sowing disturbed soil areas allows the sown seed to become established and dominant in areas that may otherwise be suitable for noxious weeds to become established, thus reducing the physical space of the potential habitat for noxious weeds to become established.

  Implementation of the Marys Peak (MP) integrated non-native plant management plan (EA # OR080-06-09) allows for early detection of non-native plant species which allows for rapid control and generally these species often persist for several years after timber harvest but soon decline as native vegetation increases within the project areas. In addition, all road construction and road maintenance areas would be monitored for Scot's broom infestations and eradicated under this proposal and as part of MP's non-native plant management plan. Other species would be eradicated as funding allows. No significant increase in populations of the noxious weed (invasive/non-native) species identified during the field surveys is expected to occur because these projects would disrupt very few acres of exposed mineral soil which could provide habitat for noxious weed species. All of the proposed timber removal activities are planned and layed out to remain below the cumulative level of 10 percent aerial extent of soil disturbance from the RMP (Timber harvest BMP's, 2008, FEIS, Appendix I).

  Carbon Sequestration (Storage) and Climate Change- (EA section 3.1.8): The Revised Upper and Lower Alsea River Restoration Projects EA (OR-080-08-08) is tiered to the PRMP FEIS (1994) which concluded that all alternatives analyzed in the FEIS, in their entirety including all timber harvest, would have only slight (context indicates that the effect would be too small to calculate) effect on carbon dioxide levels. The following show quantities of carbon in forest ecosystem vegetation[1] in the Coast Range, and in the Upper and Lower Alsea project areas.
    - Total carbon, forest ecosystem vegetation, Pacific northwest, Coast Range 1.8-2 Giga-tonnes (Gt) (Hudiburg, et al. 2009).

[1] Carbon contained in both above ground and below ground parts of trees and forest vegetation, and downed wood, litter and duff. It does not include mineral carbon in soil, nor fossil fuels.

- Total carbon, forest ecosystem vegetation, Upper and Lower Alsea River Project 1 stands = 167,600 tonnes or 0.0001676 Gt. This represents .001% of the Coast Range total.
- The annual carbon accumulation from forest management in the United States is 191 million tonnes. Current management on BLM-managed lands in western Oregon would result in an average annual accumulation of 1.69 million tonnes over the next 100 years, or 0.9% of the current U.S. accumulation. (2008 FEIS, p. 4-537).

Carbon emissions resulting from the proposed action would total 9,900 tonnes. Current global emissions of carbon dioxide total 25 billion tonnes of carbon dioxide (IPCC 2007, p. 513), and current U.S. emissions of carbon dioxide total 6 billion tonnes (EPA 2007, p 2-3). Therefore, the emissions from the proposed action would constitute .0000004% of current global emissions and .0000016% of current U.S. emissions.

Tree growth following harvest would offset greenhouse gases and result in net storage of 2,900 tonnes of carbon. The WOPR EIS (p. 4-538), which is incorporated here by reference, states that by 2106, the No Action Alternative (management under the 1995 RMP) would result in a total carbon storage of approximately 628 million tonnes, 9% higher than average historic conditions (576 million tonnes, WOPR, 3-224, as reanalyzed in November 6, 2009 memo, on file, Marys Peak Resource Area). The incremental effect of the proposed action, over time, would be net storage of carbon.

- Soils, Hydrology, and Fisheries *(EA sections 3.1.3 to 3 1.5)*:
The creation of temporary roads, yarding corridors and the mechanical removal of trees are unlikely to significantly increase sedimentation into project area streams because harvest generated slash would be maintained in the yarding corridors minimizing the need for machines to travel on bare soil. Also, ground-based equipment would only be allowed on slopes less than 35 percent. Ground-based skidding would occur during periods of low soil moisture with little or no rainfall, in order to minimize soil compaction and erosion.

  Tree removal is not proposed on steep, unstable slopes where the potential for mass wasting adjacent to streams is high. Therefore, increases in sediment delivery to streams due to harvest activities and mass wasting are unlikely to result from this action. For the protection of stream channels and aquatic resources, riparian buffers or no-treatment zones were applied to all stream channels and "high water table areas" (small wet areas, ponds, marshes, etc.) in the project areas. In addition, SPZs (stream protection zones) in riparian areas have high surface roughness, which would function to trap any overland flow and sediment before reaching streams. Therefore, increases in sediment delivery to streams due to harvest activities are unlikely to result from this action.

  The proposed projects would change forest cover between 0.1 and five percent in any of the affected 7th field drainages and between 0.5 and 1.7 percent of any affected 6th field sub-watershed. The hydrology analysis, based on the 2008 FEIS flow analysis, determined that no impacts to stream flows were anticipated (Wegner 2009). Assuming that no discernable changes in peak and base flows within the treatment area are anticipated, no alternations to fish habitat would be anticipated.

  Retention of the SPZ buffer and the location of treatments primarily adjacent to intermittent channels would be expected to maintain the existing stream temperature regimes. The proposed

action is unlikely to increase in-stream temperatures at the site (Wegner 2007). Based on the shade sufficiency analysis, the hydrology report water quality analysis and the project design features, the proposed action is unlikely to affect fish habitat downstream.

Approximately 3 miles of new road construction is proposed, on or near ridge top locations. The proposed new construction would occur on moderate to low gradient slopes, with no stream crossings. Approximately 750 feet of new road construction in Project 1 is located within 1 site potential tree of stream channels (see fisheries report), there are no new stream crossings proposed. The risk of impacts to water quality due to road construction would be limited by restricting work to periods of low rainfall and runoff. Construction would employ techniques to reduce concentration of runoff and sediment to a minimum, such as outsloping, and rock placement

- Wildlife (*EA section 3.1.2*):

The planned thinning treatments and conifer release (Projects 1 and 2) would maintain the functionality of the mid-seral forests within this landscape. There would be no discernable change in landscape conditions, since only a small portion (about 1.5 percent) of the BLM managed lands within these watersheds would be affected in several small scattered treatment units.

Air Quality and Fire Hazard/Risk (*EA section 3.1.6*): 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. Depending on the level of treatment in the various units, slash created from timber harvest would add an estimated 5 to 15 tons per acre of dead fuel to the treatment areas.

In the stands that would be commercially thinned, 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. Within one year, the risk of a fire start greatly diminishes as the dead needles and fine twigs break off, fall to the surface, absorb moisture and begin to decay. With the increased sunlight to the ground there would be increased sprouting and germination of shrub and forb vegetation. This new vegetation growth would increase the shading and humidity near the ground level raising the moisture level of the surface fuels thus reducing the risk of ignition. If a fire does start, the increase in green vegetation greatly reduces the fire intensity and spread rate due to heat absorption by the moisture contained in the green vegetation. In addition the stems and leaves of the green vegetation would block or reflect much of the heat generated by the fire and slow down the rate heat transfer and preheating of adjacent fuel which is a critical key component of fire spread. Observations 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 following logging, resistance to control would also decrease over time but more slowly. This longer time horizon is due to the fact that larger material takes longer to decay and thus stays on the site for a longer time period. Since large size class fuels are a key component in resistance to control (i.e. it takes more effort and water to extinguish these fuels) the resistance to control would decline at a slower rate commensurate with the decay rates of the larger size class material left on site. This is what is expected to occur for the areas considered in this proposed action where the slash created would be left in place, untreated.

- *Recreation , Visual Resources and Rural Interface Areas (EA section 3.1.7*): Dispersed recreation

use within the proposed units would be restricted approximately three to five years during timber management activities and return to prior usage upon completion of harvest. Other BLM lands nearby would remain available for recreational opportunities. Recreational users in the vicinity would hear the noises of the timber sale operations and experience traffic delays of minutes to hours. Harvest activities would obliterate any unauthorized trails. No reconstruction of unauthorized trails would be allowed. Existing gates would continue to restrict vehicle access and reduce unauthorized off-highway vehicle misuse of resources.

Harvest activities would remove a portion of trees from the proposed units leaving undergrowth vegetation crushed. Logging debris and crushed undergrowth vegetation would continue turning brown to red as it dies leaving the view of the units undesirable. Fuel treatment of logging debris if burned would result in short-term decline in visual quality from smoke . Understory vegetation and the remaining trees would rebound, grow, and continue to green up covering logging debris and burn pile scars.

Residences along the haul route and in close proximity to timber harvest activities may hear equipment harvesting trees, noise from log truck traffic, experience dust from gravel road traffic, and experience delays for safety. Disturbance from this proposed timber harvest would be short-term lasting a few weeks to months.

- *Public health or safety* [40 CFR 1508.27(b)(2)]: The project's effects to public health and safety would not be significant because: the projects occur in a forested setting, removed from urban/residential areas, where the primary activities are forest management and timber harvest. Public safety along haul routes would be minimally affected because log truck traffic from forest management activities on both private and public land is common and the majority of the public using these haul routes are aware of the hazards involved in driving on these forest roads. In addition warning signs near logging activities would provide for public safety.

1. *The Projects would not affect*:
   - ü Unique characteristics of the geographic area [40 CFR 1508.27(b)(3)] because there are no historic or cultural resources, parklands, prime farmlands, wild and scenic rivers, wilderness, or ecologically critical areas located within the project area s(EA section 3.0);
   - ü 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 3.0).

2. The *Projects* 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)].

3. The *Projects* 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.

4. The interdisciplinary team evaluated the *Projects* 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 area of 810 acres, encompassing less than 0.1 percent of the forest cover within the Upper Alsea River Watershed and less than 0.5 percent of the forest cover within the entire Alsea River Watershed), and duration [direct effects would occur over a maximum period of four to six years (EA section 3.2)].

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

U. S. Fish and Wildlife Service (USFWS)
To address concerns for potential effects to listed wildlife species and potential modification of critical habitats, the proposed action was consulted upon with the USFWS, as required under Section 7 of the Endangered Species Act. Consultation was addressed by inclusion of the proposed action units within either of two batched Biological Assessments (BAs) that analyze all projects that may modify the habitat of listed wildlife species on federal lands within the Northern Oregon Coast Range during fiscal years 2009 and 2010. Project 1 and 2 treatments have been designed to incorporate all appropriate design standards included in these BAs. A Letter of Concurrence (#13420-2008-I-0125) and a Biological Opinion (#13420-2009-F-0012) have been received from the USFWS and they do not require any changes or additions to the incorporated project design standards. The Biological Opinion also concludes that the proposed action would not result in jeopardy to listed species and would not adversely modify critical habitat for either the spotted owl or marbled murrelet.

National Marine Fisheries Service (NMFS)
Consultation with NMFS is required for all actions which 'may affect' ESA listed fish species and critical habitat. The area where the proposed actions are located has two major stream systems (North Fork Alsea River and South Fork Alsea River). Oregon Coastal (OC) Coho Salmon are listed as threatened under the ESA, as amended, and are known to occur in the North Fork Alsea River and South Fork Alsea River systems.

The Density Management portions of the project activities were designed in conformance with guidance described in *Endangered Species Act Section 7 Informal Consultation for the 2008-2009 North Coast Province Thinning Timber Sales Programmatic on Portions of the Siuslaw National Forest and Eugene and Salem Districts of the Bureau of Land Management, Seven Watersheds within the Oregon Coast Recovery Domain.* Submission of consistency documentation under the North Coast Thinning Programmatic, or a standalone Biological Assessment would be needed to conduct consultation for the May Affect actions. Actions which do not comply with design criteria, or are within acceptable variances of the North Coast Thinning Programmatic would require separate ESA consultation coverage.

Actions conducted independently of the proposed thinning (those actions not interrelated or interdependent to thinning activities), may be covered under separate programmatic consultations including the Aquatic Restoration Biological Opinion (ARBO) *ESA 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, CY2007-2012* or the programmatic Biologic Opinion resulting from the *Biological*

Assessment for Programmatic Forest Service and Bureau of Land Management Activities in Northwest Oregon. The proposed projects would comply with project design features as described under these programmatic consultations, including pre-notifications requirements. Actions and effects beyond the scope of the NMFS programmatic consultations would require additional consultation with NMFS.

Protection of EFH as described by the Magnuson/Stevens Fisheries Conservation and Management Act and consultation with NMFS is required for all projects which may adversely affect EFH of Chinook and coho salmon. The treatment project areas vary between 55 feet and over 5 miles from nearest habitat utilized by coho salmon (Streamnet 2007). Portions of the unpaved haul routes, and stream crossing on the haul route are adjacent to EFH. All proposed haul routes adjacent to EFH would be seasonally restricted to dry conditions. The proposed Projects 1 and 2 are not expected to adversely affect EFH. The determination is based on distance of vegetation treatment activities from occupied habitat and the dry season of use for hauling on unpaved roads in the Upper and Lower Alsea River Watersheds. Consultation with NMFS on EFH is not required for these projects.

6. *The Projects* 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)].

Approved by: _____ _____

Trish Wilson, Field Manager Date

Marys Peak Resource Area

Glossary: Abbreviations, Acronyms, and Terms

Airshed	A geographic area that shares the same air mass due to topography, meteorology, and climate.
Alternative	Proposed project (plan, option, choice)
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.
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
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
U. S. Fish and Wildlife Service	USFWS. 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.
FONASI	Finding of No Additional 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.
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.
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).
Native Plant	Species that historically occurred or currently occur in a particular ecosystem and were not introduced.
NEPA	National Environmental Policy Act (1969)
NMFS	National Marine Fisheries Service. Federal agency which is responsible for the regulation of anadromous fisheries in the U. S.
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.
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.
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 is closed to vehicular traffic. Road is waterbarred. May include removal of culverts, ripping and seeding of roadbed. Road prism remains intact for future use.
Road Improvement	Work done to an existing road which improves it over its original design standard. May include widening of subgrade, upgrading existing culverts, and applying rock surfacing that exceeds original design standards.
Road Renovation	Work done to an existing road which restores it to its original design standard. May include blading and shaping of a roadway, clearing brush from cut and fill slopes, cleaning or replacing culverts, and applying rock surfacing material to depleted surfaces. Generally these roads are driveable prior to work commencing.
ROD	Record of Decision. Document that approves decisions to the analyses presented in the FEIS.
RR	Riparian Management Areas (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.
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 DBHOBOB 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 whichever is greater.
Standards and Guidelines	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 quality to change conditions.
USDI	United States Department of the Interior
USEPA	United States Environmental Protection Agency
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.
Windthrow	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.

REVISED UPPER AND LOWER ALSEA RIVER WATERSHED RESTORATION ENVIRONMENTAL ASSESSMENT

Table of Contents

1.0 INTRODUCTION

This Environmental Assessment (EA) is a revision of the Upper and Lower Alsea River Watershed Restoration EA (original EA) that was published and made available for public review from July 16, 2009 to August 16, 2009. The original Upper and Lower Alsea River Watershed Restoration EA is incorporated by reference.

The purpose of the revised EA, hereafter referred to as this EA, is to respond to the comments received on the original EA.

This EA will analyze the impacts of proposed density management and conifer release operations and connected actions on the human environment in the Upper Alsea River and Lower Alsea River fifth field watersheds. The EA will provide the decision-maker, the Marys Peak Resource Area Field Manager, with current information to aid in the decision-making process. It will also determine if there are significant impacts not already analyzed in the Environmental Impact Statement for the Salem District's Resource Management Plan and whether a supplement to that Environmental Impact Statement is needed or if a Finding of No Additional Significant Impact is appropriate.

Section 1 of this EA for the proposed mid-seral enhancement and conifer release projects provide a context for what will be analyzed in the EA, describes the kinds of action we will be considering, defines the project areas, describes what the proposed actions need to accomplish, and identifies the criteria that we will use for choosing the alternative that will best meet the purpose and need for this proposal.

This March 2010 revision of the EA addresses Carbon Sequestration (Storage) and Climate Change.

1.1 Projects Covered in this EA

Two projects will be analyzed in this EA (Environmental Assessment):

- Project 1, Mid-Seral Habitat Enhancement, is a proposal to cut and remove a portion of the trees through three timber sales on approximately 768 acres of 34 to 72 year-old stands within LSR (Late Successional Reserve) and RR (Riparian Reserve) LUAs (Land Use Allocations).
- Project 2, Conifer Release, is a proposal to promote late successional forest by restoring conifers on approximately 42 acres of hardwood dominated stands within LSR and RR LUAs.

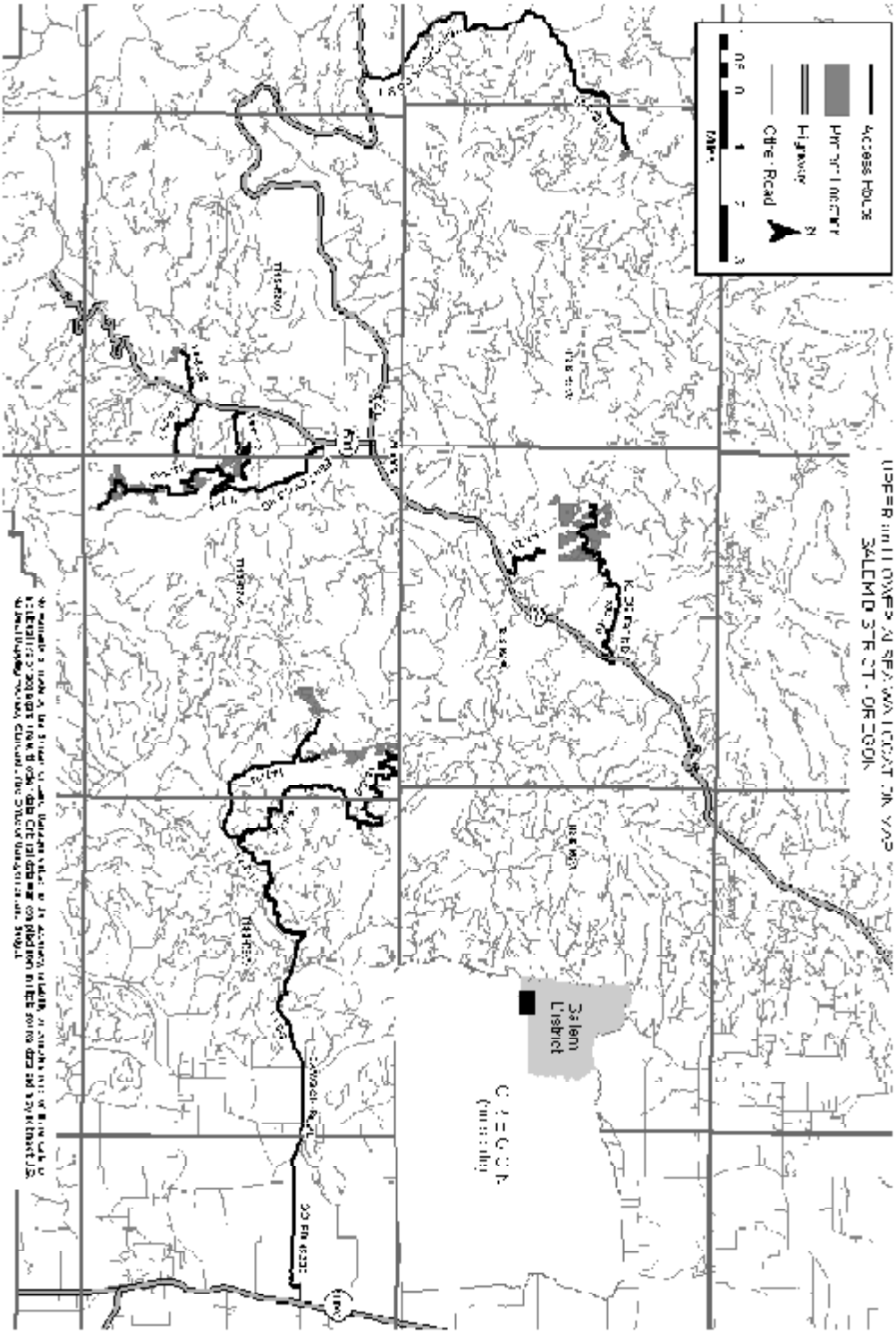
1.1.1 Relationship between Projects

Projects 1 and 2 are within the Upper and Lower Alsea River Watersheds.

1.2 **Project Area Location**

The project areas are located approximately 13 to 20 air miles southwest of Corvallis, Oregon, in Benton County on forested land managed by the Marys Peak Resource Area, Salem District of the BLM. The project areas are within Township 14 South, Range 7 West, Sections 1, 11, 12, 19, 30 and 31, Township 13 South, Range 7 West, Sections 17 and 19, Township 13 South, Range 8 West, Section 7, and Township 14 South, Range 8 West, Sections 25 and 26, Willamette Meridian (Map 1).

Map 1: Vicinity Map



1.3 **Conformance with Land Use Plans, Policies, and Programs**

On July 16, 2009 the U.S. Department of the Interior, withdrew the Records of Decision (2008 ROD) for the Western Oregon Plan Revision and directed the BLM to implement actions in conformance with the resource management plans for western Oregon that were in place prior to December 30, 2008.

The proposed density management activities in the project areas 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:

1. *Salem District Record of Decision and Resource Management Plan***,** May 1995 (RMP) as amended: The RMP has been reviewed and it has been determined that the proposed thinning activities 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 is the reason for doing these activities (RMP p.1-3);
2. *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 (the Northwest Forest Plan, or NWFP);
3. *Record of Decision and Standards and Guidelines for Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (S&M ROD, January 2001)

The analysis in the Revised Upper and Lower Alsea River Watershed Restoration EA is site-specific, and supplements and tiers to analyses found in the *Salem District Proposed Resource Management Plan/Final Environmental Impact Statement*, September 1994 (RMP/FEIS). The RMP/FEIS includes the analysis from the *Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl*, February 1994 (NWFP/FSEIS). In addition, the EA is tiered to the *Final Supplemental Environmental Impact Statement For Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (S&M FSEIS, November 2000).

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 Revised Upper and Lower Alsea River Watershed Restoration EA project:

- *Late-Successional Reserve Assessment Oregon Coast Province- Southern Portion* (LSRA, see USDA-FS and USDI-BLM 1997);

- *South Fork Alsea River Watershed Analysis* (SFAWA), USDI BLM, 1995, *Lower Alsea River Watershed Analysis* (LAWA), USDI BLM 1999 and *North Fork Alsea River Watershed Analysis* (NFAWA), USDI BLM, 1996.

The above documents, along with the Revised Upper and Lower Alsea River Watershed Restoration IDT (interdisciplinary team) reports (EA section 7.1.1), are hereby incorporated by reference in the Revised Upper and Lower Alsea River Watershed Restoration EA and available for review in the Salem District Office. Additional information about the proposed projects is available in the Upper and Lower Alsea River Watershed Restoration NEPA/EA File, also available at the Salem District Office.

1.3.1 Survey and Manage Review

The Upper and Lower Alsea River Watershed Restoration projects are consistent with court orders relating to the Survey and Manage mitigation measure of the Northwest Forest Plan, as incorporated into the Salem District Resource Management Plan.

On December 17, 2009, the U.S. District Court for the Western District of Washington issued an order in *Conservation Northwest, et al. v. Rey, et al.*, No. 08-1067 (W.D. Wash.) (Coughenour, J.), granting Plaintiffs' motion for partial summary judgment and finding a variety of NEPA violations in the BLM and USFS 2007 Record of Decision eliminating the Survey and Manage mitigation measure. Previously, in 2006, the District Court (Judge Pechman) had invalidated the agencies' 2004 RODs eliminating Survey and Manage due to NEPA violations. Following the District Court's 2006 ruling, parties to the litigation had entered into a stipulation exempting certain categories of activities from the Survey and Manage standard (hereinafter "Pechman exemptions").

Judge Pechman's Order from October 11, 2006 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."

Following the Court's December 17, 2009 ruling, the Pechman exemptions are still in place. Judge Coughenour deferred issuing a remedy in his December 17, 2009 order until further proceedings, and did not enjoin the BLM from proceeding with projects (including timber sales). Nevertheless, I have reviewed the Upper and Lower Alsea River Watershed Restoration projects are consideration of both the December 17, 2009 and October 11, 2006 order. Because the Upper and Lower Alsea River Watershed Restoration projects entail no regeneration harvest and entails thinning only in stands less than 80 years old, I have made the determination that these projects meet Exemption A of the Pechman

Exemptions (October 11, 2006 Order), and therefore may still proceed to be offered for sale even if the District Court sets aside or otherwise enjoins use of the 2007 Survey and Manage Record of Decision since the Pechman exemptions would remain valid in such case. The first notice for sale will appear in the newspaper on April 28, 2010.

1.3.2 Northern Spotted Owl (NSO) Status Review

"The following information was considered in the analysis of the Upper and Lower Alsea River Watershed Restoration proposed activities: a/ *Scientific Evaluation of the Status of the Northern Spotted Owl* (Sustainable Ecosystems Institute, Courtney et al. 2004); b/*Status and Trends in Demography of Northern Spotted Owls,* 1985-2003 (Anthony et al. 2004); c/ *Northern Spotted Owl Five Year Review: Summary and Evaluation* (USFWS, November 2004); and *Northwest Forest Plan – The First Ten Years* (1994-2003): d/ *Status and trend of northern spotted owl populations and habitat, PNW Station Edit Draft* (Lint, Technical Coordinator, 2005).

The Salem District analyzed reports regarding the status of the northern spotted owl and although the agencies anticipated a decline of NSO populations under land and resource management plans during the past decade, the reports identified greater than expected NSO population declines in Washington and northern portions of Oregon, and more stationary populations in southern Oregon and northern California."

The reports did not find a direct correlation between habitat conditions and changes in NSO populations, and they were inconclusive as to the cause of the declines. Lag effects from prior harvest of suitable habitat, competition with barred owls, and habitat loss due to wildfire were identified as current threats. West Nile Virus and Sudden Oak Death were identified as potential new threats. Complex interactions are likely among the various factors. This information has not been found to be in conflict with the NWFP or the RMP (*Evaluation of the Salem District Resource Management Plan Relative to Four Northern Spotted Owl Reports, September 6, 2005).*

1.3.1 Compliance with the Aquatic Conservation Strategy

On March 30, 2007, the District Court, Western District of Washington, ruled adverse to the US 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.

EA section 5.0 shows how the Revised Upper and Lower Alsea River Watershed Restoration projects meet the Aquatic Conservation Strategy in the context of the PCFFA cases. In addition, project design features (p. 20) would provide protection measures to meet ACS objectives.

1.4 Decision Criteria/Project Objectives

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

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

1.5 Results of Scoping

A scoping letter, dated August 28, 2008, was sent to 22 potentially affected and/or interested individuals, groups, and agencies. Two responses were received during the scoping period.

A description of the project was included in the June, September and December 2008, and March and June 2009 project updates to solicit comments on the proposed project.

In addition, the original EA and FONSI document was made available for public review between July 16, 2009 and August 16, 2009. Two (2) comment letters/emails were received during the original EA comment period. The scoping and EA comment letters/emails are available for review at the Salem District BLM Office, 1717 Fabry Rd SE, Salem, Oregon. This Revised Upper and Lower Alsea River Watershed Restoration EA includes additional information which addresses EA comments.

1.6 Purpose of and Need for Action

Project 1 (Mid Seral Enhancement)

Purpose

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

The proposed project is intended to implement a subset of specific management opportunities in a manner consistent with standards and guidelines described below. The BLM proposes forest management activities on approximately 768 acres. These activities would include: timber harvest,

road construction, renovation, and coarse woody debris (CWD) creation. The LUAs for these activities are LSR and RR.

The following describe the purpose for the action:

Late Successional Reserve Area LUA (1995 RMP p. 15-19): Manage forest stands and wildlife habitat in the LSR LUA to:

- Late-successional habitat, ecosystems and biological diversity associated with native species are created and maintained (*Late Successional Reserve Assessment, Oregon Coast Province - Southern Portion*, p. 1).
- Plan and implement silvicultural treatments inside Late-Successional Reserves that are beneficial to the creation of late-successional habitat (RMP p. 16).
- If needed to create and maintain late-successional forest conditions, conduct thinning operations in forest stands up to 80 years of age. This will be accomplished by precommercial or commercial thinning of stands regardless of origin (e.g., planted after logging or naturally regenerated after fire or blowdown) (RMP p. 16).

Manage mid-seral stands in RR LUA (RMP pp. 7-15) to:

- Accelerate the growth of trees to restore large conifers to Riparian Reserves (RMP p.7).
- Enhance or restore habitat (e.g. CWD, snag habitat, in-stream large wood) for populations of native riparian-dependent plants, invertebrates, and vertebrate species (RMP p.7).
- Apply silvicultural practices for Riparian Reserves to control stocking, reestablish and manage stands, and acquire desired vegetation characteristics needed to attain Aquatic Conservation Strategy objectives (RMP p. 11).

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.
- Reduce environmental effects associated with identified existing roads within the project area.

The project would be implemented through the sale of three separate timber sales.

Need For Action

Current forest stand exam data indicates early and mid seral forests in the project areas have declining growth rates and limited structural diversity. These second-growth forests have stands characterized by a single-layered, dense, overstory canopy with little to no large wood remaining from the primary growth stand. There is a need to improve wildlife and aquatic habitat on approximately 768 acres of early and mid seral forests by reducing stand densities using variable spacing methods and creating immediate terrestrial CWD. This could lead to an increase in fish and late successional wildlife species populations.

Available literature suggests that variable-density thinning prescriptions hold promise for acceleration of the development of spotted owl habitat and dense prey populations (Carey 1995, 2001) especially when appropriate attention is paid to decadence (snags, cavity trees, and coarse woody debris) (Bunnell et al. 1999; Carey et al. 2002). This is because variable density thinning emphasizes multi-

species management. Therefore, variable density treatments are likely the most favorable prescriptions for providing key habitat structural elements for spotted owl prey.

Large wood is an important component of aquatic habitat in forested ecosystems. Large wood accumulation within stream channels is necessary for many aquatic habitat functions including: providing cover for fish, sediment storage for food supply and spawning grounds, nutrient retention, pool formation, and formation of off-channel habitat.

The proposed action would retain trees which would reach larger diameters earlier compared to the no treatment option, creating natural opportunities for higher quality LWD recruitment in the long-term. In the long-term the increase in the size of trees in the RR LUA could beneficially affect LWD recruitment to the stream channel, thus potentially improving the quality/complexity of aquatic habitat adjacent to the treatment areas in the future.

Approximately 3 miles of new road (ridge top locations) would be constructed. All new construction would be surfaced with road surface rock. Drain dips would be installed where cross drainage is necessary. All of the new construction would be decommissioned (waterbars installed, grass seed applied to exposed soil on cut/fill slopes and entrance blocked) upon completion of burning operations.

In addition, existing roads within the project areas contain culverts that are beyond their functional life span. The roads also lack adequate amounts of culverts and rock to prevent environmental degradation during timber haul use.

Rock application and culvert replacement/installation on 54 stream crossing and/or cross drain locations would occur on approximately 30 miles of roads (Roads 14-6-17, 14-6-18, 14-7-24, 14-6-12.1, 13-7-10, 14-7-18, 14-7-19 and 14-6-6). Cut and fill slopes adjacent to culvert replacement/installments would be grass seeded and large rock would be placed as needed for erosion control. New culverts installed would meet 100-year flood design criteria.

There are hazard trees along roads that have the potential to fall into the road. Fallen hazard trees increase the maintenance workload for the resource area. There is a need to remove hazard trees before they fall to improve the road safety and address maintenance cost concerns. Imminent and likely hazard trees located adjacent to Roads 14-6-6, 14-7-24, and 14-7-19 (3.4 miles total) would be cut and removed.

Project 2 (Conifer Release)

Purpose

The purpose of the proposed project is

- Develop, accelerate, and enhance late-successional forest conditions, which serve as habitat for late-successional forest species (LSRA, p. 2).
- Plan and implement silvicultural treatments inside Late-Successional Reserves that are beneficial to the creation of late-successional habitat (RMP p. 16).
- Accelerate the growth of trees to restore large conifers to Riparian Reserves (RMP p.7).
- Enhance or restore habitat (e.g. CWD, snag habitat, in-stream large wood) for populations of native riparian-dependent plants, invertebrates, and vertebrate species (RMP p.7).

The project would be implemented by offering a timber sale.

Need For Action

Current forest stand exam data indicates project areas consist of stands dominated by red alder with an understory of scattered conifers. Very few conifer trees, snags and CWD exist within the upland stands. There is a need to release existing conifer trees, so in the future there are large conifers to function as nest trees, CWD, snags and large wood for streams. This could lead to an increase in fish population and wildlife species dependent upon late successional forests.

2.0 Alternatives

2.1 Alternative Development

Pursuant to Section 102 (2) (E) of the National Environmental Policy Act (NEPA) of 1969, as amended, federal agencies shall "Study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." An unresolved conflict concerning sedimentation from timber hauling and hauling cost of the different haul routes were used to generate an alternative.

An alternative proposing to use an alternative road system for the timber haul route would meet the purpose and need of Project 1 and address these conflicts. Therefore, this EA will analyze the effects of Alternative 1 (No Action), Alternative 2 [(Proposed Action) Peak Creek Road timber haul route)], and Alternative 3 (Buck Peak Road timber haul route).

2.2 Alternative 1 (No Action)

The No Action Alternative describes the environmental baseline against which the effects of the action alternatives can be compared, i.e. the existing conditions in the project area and the continuing trends in those conditions if the BLM does not implement any of the proposed actions. Consideration of this alternative also answers the question: "What would it mean for the objectives to not be achieved?" The "No Action Alternative" means that no timber management actions or connected actions would occur. If this alternative were to be selected, the following items would not be done in the project area at this time:

- Silviculture treatments
- Timber harvest
- Road construction, renovation, improvement or decommissioning
- Fuel reduction treatments

Only normal administrative activities and other uses (e.g. road use, programmed road maintenance, harvest of special forest products on public land) would continue on BLM managed lands within the project area. On private lands adjacent to the project area, forest management and related activities would continue to occur. Selection of the No Action Alternative would not constitute a decision to change the land use allocations of these lands. Selection of the No Action Alternative would not set a precedent for consideration of future action proposals.

2.3 **Alternative 2 (Proposed Action)**

Common to Both Action Alternatives

Project 1 (Mid-Seral Enhancement)

The project consists of mid-seral enhancement on approximately 768 acres of 34 to 72 year-old stands within LSR and RR LUAs. Approximately 768 acres would be thinned to a variable density (basal area ranging from 100 to 150 square feet/acre). Trees would be skyline yarded on approximately 457 acres, ground based yarded on approximately 138 acres and aerial yarded on approximately 187 acres.

This project would occur through three timber sales (North Fork Overlook, Buck Roberts and Bummer Ridge).

2.3.1 **Connected Actions Common to Both Action Alternatives**

1. **Road Work**:

- **Road Construction:** Approximately 3 miles of new road (ridge top locations) would be constructed. All new construction would be surfaced with road surface rock. Drain dips would be installed where cross drainage is necessary. All of the new construction would be decommissioned (waterbars installed, grass seed applied to exposed soil on cut/fill slopes and entrance blocked) upon completion of burning operations.
- **Road Renovation:** Rock application and culvert replacement/installation on 54 stream crossing and/or cross drain locations would occur on approximately 30 miles of roads (Roads 14-6-17, 14-6-18, 14-7-24, 14-6-12.1, 13-7-10, 14-7-18, 14-7-19 and 14-6-6). Cut and fill slopes adjacent to culvert replacement/installments would be grass seeded and large rock would be placed as needed for erosion control. New culverts installed would meet 100-year flood design criteria. Imminent and likely hazard trees located adjacent to Roads 14-6-6, 14-7-24, and 14-7-19 (3.4 miles) would be cut and removed.

Photo of Buck Roberts LSR Enhancement (Pre-Harvest)

Photo of Klickitat Tie LSR Enhancement (Post Harvest 2003)

Project 2 (Conifer Release)

The BLM proposes to treat approximately 42 acres by removing hardwoods and cutting brush. The proposed action would release scattered Douglas-fir, western red cedar and western hemlock by cutting competing hardwoods. Red alders would be cut around each conifer identified for release to allow approximately 60 percent of total potential light to reach each released tree. Only those overtopped trees that demonstrate a good chance for survival would be released.

Logs would be yarded using ground based equipment, a small mobile cable yarder, or similar equipment. Equipment would operate on Roads 13-9-23.1, 13-8-7, 14-7-19 and 14-8-26 and use pre-existing skid trails to the greatest extent possible.

Untreated Hardwood Stand with Existing Conifer Understory Trees to be Released

Treated Hardwood Stand with Existing Conifer Trees

2.3.2 **Project Design Features Common to Both Action Alternatives**

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

Table 1: Season of Operation/Operating Conditions (Projects 1 and 2)

Season of Operation or Operating Conditions	Applies to Operation	Objective
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
During periods of low soil moisture, generally June 15 to October 31	Ground based yarding (Harvester/Forwarder) and (Hydraulic Loader) and machine chipping and/or piling	Minimize soil erosion/compaction
During periods of low precipitation, generally May 1 to October 31	Road construction/renovation/reconstruction	Minimize soil erosion
Generally year round	Timber hauling would be allowed year-round on rock surfaced roads except where the surface is deeply rutted or covered by a layer of mud and where runoff is causing a visible increase in turbidty to adjacent streams and except on roads as noted below	Minimize soil erosion/stream sedimentation
July 1 to August 31	In-stream work period (culvert removal and replacement)	Minimize soil erosion/stream sedimentation

Table 2: Season of Operation/Operating Conditions (Project 1 Only)

Season of Operation or Operating Conditions	Applies to Operation	Objective
During periods of dry weather and low soil moisture, generally May 1 to October 31	Timber hauling on the following roads: Roads 14-6-6, 14-7-19, 14-7-18, 14-7-19.1, 14-7-19.3, 14-7-19.5, 14-7-31, 14-8-25.1, 14-8-24.3, Bummer Ridge LSR Enhancement P2 to P9	Minimize soil erosion/ stream sedimentation
Time period beginning two hours after sunrise and ending two hours before sunset (April 1 through September 15) for the following Project 1 units: Buck Roberts 1B, 11A, 11B, 12A; Bummer Ridge 19B, 30A and 31B.	Operation of power equipment	Minimize noise disturbance (marbled murrelet)
During the critical breeding season (March 1 to July 7). Restriction can be lifted if resident owls are found to be non-nesting during this time.	All felling and yarding operations within 0.25 miles of the active nest site	Minimize noise disturbance (northern spotted owl))
September 15 to April 1	Operation of Type I helicopter within 100 meters of un-surveyed marbled murrelet habitat	Minimize noise disturbance (marbled murrelet)

Season of Operation or Operating Conditions	Applies to Operation	Objective
During the critical breeding season (April-1 to Spetember-15). .	Helicopter use of the landing in the southeast portion of Section 17 of North Fork Overlook project. Felling and yarding in Unit 17B adjacent to the helicopter landing would follow the same restriction	Minimize noise disturbance (marbled murrelet)
Time period restriction beginning two hours after sunrise and ending two hours before sunset (August 5 to September 15). (No time period restrictions between September 15 and April 1)	Operation of Type II helicopter within 100 meters of un-surveyed marbled murrelet habitat	Minimize noise disturbance (marbled murrelet)

Table 3: Season of Operation/Operating Conditions (Project 2 Only)

Season of Operation or Operating Conditions	Applies to Operation	Objective
During periods of dry weather and low soil moisture, generally May 1 to October 31	Timber hauling on the following roads: Roads 13-9-23.1, 13-8-7, 14-8-26, 14-7-18, 14-7-19 and Fall Creek Road.	Minimize soil erosion/stream sedimentation

Project Design Features for Projects 1 and 2

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

- All logging activities would utilize the Best Management Practices (BMPs) required by the Federal Clean Water Act (as amended by the Water Quality Act of 1987) (2008, FEIS, Appendix I) . The BMP's listed below would be applied to this project.
- Implement erosion control measures such as waterbars, slash placement and seeding in cable yarding corridors and skid trails where the potential for erosion and delivery to waterbodies, floodplains and wetlands exists. Construct waterbars on skid trails using guidelines in Table I-21, page 289, Appendix I.
- Scatter treatment debris on disturbed soils and water bar any yarding trails that could erode and deposit sediment in water bodies, floodplains, and wetlands.
- Plan use on existing and new skid trails to be less than 10 percent of the harvest area.
- Limit width of skid trails to what is operationally necessary for the equipment.
- Ensure one-end suspension of logs during ground based skidding.
- Limit conventional ground based equipment to slopes less than 35 percent.
- Skid and harvest roads would be blocked where they access main vehicular roads following completion of ground-based yarding.
- Fell harvested trees away from stream channels when possible.
- 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. Lateral yarding using an energized locking carriage would be required. Lateral yarding using an energized locking carriage would be required.

- Other ground based yarding equipment could be utilized as long as it meets best management practices and results in equivalent or less than the level of impacts analyzed for the project.
- Repair damaged culvert ends and downspouts to maintain drainage design capacity.
- In the skyline yarding areas, one end suspension of logs would be required over as much of the areas as possible to minimize soil compaction, damage to reserve trees, and disturbance.
- During periods of heavy rainfall, the contract administrator may restrict log hauling where the road surface is deeply rutted or covered by a layer of mud and where runoff from that road segment is causing a visible increase in turbidity to adjacent streams. To minimize water quality impacts, the purchaser may also be required to install silt fences, barkbags, or place additional road surface rock.
- All hazard trees cut in the stream protection zones (SPZs) would be left as long as they do not pose a threat to safety of existing structures (culverts and bridges, etc.).

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

- All soil disrupting equipment moved into the project area would be required to be clean and free of dirt and vegetation as directed by the contract administrator.
- All locations (except within Bummer Ridge Timber Sale Area) where mineral soil is exposed (roads to be constructed/renovated, skid trails and landings, culvert replacements/installations) would be sown with Oregon Certified (blue tagged) red fescue (*Festuca rubra*), and/or sown with a wildlife vegetation mix and applied at a rate equal to 40 pounds per acre or sown/planted with other native species as approved by the resource area botanist.
- Skid trails and landings within Bummer Ridge Timber Sale Area where mineral soil is exposed would be sown with a wildlife vegetation mix or sown/planted with other native species as approved by the resource area botanist.
- Roads to be constructed/renovated and culvert replacement/installations within Bummer Ridge Timber Sale Area where mineral soil is exposed would be sown with Oregon Certified (blue tagged) red fescue (*Festuca rubra*) at a rate equal to 40 pounds per acre or sown/planted with other native species as approved by the resource area botanist.

To meet the objectives of the Riparian Reserves:

- Stream protection zones where no cutting and/or yarding is permitted would be established along all streams and identified wet areas within the harvest areas. These zones would be a minimum of 55 feet from the high water mark. Stream protection zone width would be established through shade sufficiency analysis (Silviculture Prescription Appendix 4).
- To protect water quality, all trees within one tree height of SPZs would be felled away from streams. Where a cut tree does fall within a SPZ, the portion of the tree within the SPZ would remain in place.
- No yarding would be permitted in or through any SPZs within the harvest areas.
- No refueling would be allowed within 100 feet of any standing or running water.
- Woody material removed from stream crossing for culvert maintenance must be retained in the stream network.

To protect and enhance stand diversity and wildlife habitat components:

<u>Priorities for tree marking would be based on the following:</u>

- Priorities for tree marking would be based on Marking Guidelines. Tree selection would be designed to leave a range of diameter distribution, maintain or increase the proportion of minor

species, create variable density of leave trees, and retain legacy and wildlife tree structure while meeting target densities. *Bummer Ridge*: Residual tree densities range from 100 to 150 sq. ft. (square feet) basal area and approximately 30 to 45 TPA (trees per acre), *Buck Roberts:* Residual tree densities range from 100 to 150 sq. ft. (square feet) basal area and approximately 37 to 89 TPA. *North Fork Overlook:* Residual tree densities would range from 116-145 sq. ft. (square feet) basal area and approximately 35 to 45 TPA and *Project 2*: 140-200 TPA.

- Understory conifers less than 7 inches DBHOB (diameter breast height outside bark) would be excluded from harvest.
- Open grown trees with significant defect, cavities, or dead or broken tops, and existing snags and CWD would be reserved, except where they pose a safety risk or affect access and operability. Any snags or logs felled or moved for these purposes would remain on site within the project area.
- Additional trees would be reserved around large snags (greater than 20 inches DBHOB and 40 feet in height) to protect them from logging operations and reduce the likelihood of their cutting for worker safety reasons.
- Additional trees would be cut around seedlings and understory trees to increase growing space. The number of additional reserved trees would be approximately equal to the number of additional cut trees, thereby keeping the prescribed trees per acre described in Revised Upper and Lower Alsea River Watershed Restoration Project EA Analysis File (see NEPA file).
- Any plus trees (trees selected for genetic traits) and their reference trees, and bearing trees would be reserved from harvest.
- Additional trees would be cut around mature open-grown trees or old-growth remnant trees to remove competition from around them to maintain their growth and wide crowns.
- Any tree found to have a stick or ball nest, regardless of size (tree or nest) would be protected.

To reduce fire hazard risk and protect air quality:

- Whenever possible, alternative waste recycling of slash material would be encouraged. This may be **a**ccomplished by: providing firewood to the public, chipping for co-gen power production, chipping for soil amendments, soil protection, etc.
- If waste recycling is chosen in lieu of burning slash, only logging slash and debris readily available from existing roads and landings would be recycled. Additional yarding separate from the commercial timber harvesting would not be allowed for the sole purpose of obtaining material to recycle. Exsting roads and landings should not be enlarged to accommodate chipping on site.
- Fuel treatment strategies would include directional falling (to keep slash away from fuel breaks), followed by a reduction of surface fuels to reduce the intensity and severity of potential wildfires in the long-term. Fuels reduction may be accomplished by burning of slash piles, by machine processing of slash on-site, or by a combination of these techniques.
- Debris cleared during road construction and renovation would be scattered along the length of rights-of-way in a manner that would minimize large concentrations.
- Large accumulations of debris on or within 30 feet of the edge of landings; constructed and existing roads would be machine or hand piled. Logs, tops, and debris would be decked or piled as directed by the contract administrator (except for logs sold and removed from the project area).
- For areas that are to be machine piled or chipped, mechanical equipment would remain on slopes averaging 35 percent or less (unless the equipment is specifically designed to operate on steeper slopes and approved by the contract administrator).

- All piles would be located at least ten feet away from reserve trees and snags. Windrows would be avoided unless approved by the contract administrator.
- During the late summer before the onset of fall rains, all machine and hand piles to be burned would be covered at least 80 percent with 4 mil black polyethylene plastic.
- All burning would occur under favorable smoke dispersal conditions in the fall, in compliance with the Oregon State Smoke Management Plan.
- Fuels treatment of any kind would be prohibited within SPZs.
- Hand piling of fuels intended for burning is prohibited closer than 100 feet from any stream channel.
- Mechanical fuels treatment would be prohibited closer than 200 feet from any stream channel.

To protect Special Status Species:

- Required pre-disturbance surveys and known-site management for any listed botanical, fungal, or animal species would be accomplished in accordance with BLM Manual 6840- *Special Status Species Management*, and. *Record of Decision and Standards and Guidelines for Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (S&M ROD, January 2001).
- The resource area biologist and/or botanist would be notified if any listed botanical, fungal or animal species are found occupying stands proposed for treatment during project activities. If the species is a federal listed ESA or Category A, B or E Survey and Manage species then all of the known sites would be withdrawn from any timber harvesting activity. If the species is other than a federal listed ESA or Category A, B or E Survey and Manage species, then appropriate mitigation action would be taken.
- For any listed botanical species whose characteristics make locating them with field surveys practical, clearances would generally be done by field surveys using intuitive controlled methods, field clearances, field reconnaissance, inventories, and/or habitat examinations. Clearances for fungi are considered "not practical" and surveys are not required.

To Protect Cultural Resources:

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

<u>Project Design Features for Project 1 only</u>

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:

- Helicopter yarding would be allowed subject to noise disturbance as stated in Table 2. Full suspension lift would be required.

To meet the objectives of the Riparian Reserve Areas:

- From the SPZ to the upper edge of the RR LUA, stand density would be reduced using the same prescription used on the upland forest, though additional trees would be left as necessary to maintain 50 percent canopy cover in the secondary shade zone (one site potential tree height).

To protect and enhance stand diversity and wildlife habitat components:
Priorities for tree marking would be based on the following:

- In areas infected with *Phellinus weirii,* remove symptomatic trees and all Douglas-fir trees (the most susceptible species) within 50 feet of dead or symptomatic trees. If openings greater than approximately 0.25 acre are created, large nursery stock of non-susceptible or immune species would be planted.
- At least 2 green trees/acre intended to be part of the residual stand would be felled/girdled/topped to function as CWD at the completion of harvest operations. Trees to be utilized for CWD creation would be stand average DBHOB or larger. Incidentally felled or topped trees (ie. tail-trees, intermediate supports, guyline anchors, hang-ups, etc.) that are left by harvest operations would be counted toward this target. If such incidentally felled trees are removed/sold, additional trees would be felled/girdled/topped to meet this target.
- Clumps would be retained through variable density thinning and would not exceed 0.1 acre in size. However, several areas would remain untreated due to logging infeasibility and riparian buffers.
- Except in yarding corridors/skid trails and gaps, and in areas of Bummer Ridge Unit 19C dominated by hardwood, species diversity would be maintained by reserving all trees (merchantable and non merchantable) other than Douglas-fir and western hemlock.

To reduce unauthorized recreation use:

- All undesignated off highway vehicle (OHV) trails would be blocked following harvest operations.

Project Design Features for Project 2 only

To protect and enhance stand diversity and wildlife habitat components:

- Hardwood trees that overtop or compete with conifer trees (Douglas-fir, western red cedar, and western hemlock) would be removed (generally, within 50 feet of conifer trees). Additional hardwood trees would be selectively removed to reduce overall density, and as needed to facilitate harvest operations.
- A portion of Unit 7A contains dense conifer; approximately 2 acres would be thinned to 120 sq. ft. basal area.
- Unit 7D contains very few conifer trees. Two to four openings of 0.5 acre or less would be created in the hardwood stand and large container stock of western hemlock and western red cedar would be planted.
- To maintain growth and survival of released or planted conifer within ten years following initial treatment, competing hardwood and shrub growth may be cut with a chainsaw.

2.4 Alternative 2 (Proposed Action)

Proposed crossing treatment at Peak Creek (Road 14-6-6) would include the installation of a hardened low water ford. The design techniques would provide passage for native fish, aquatic fauna, bedload, and debris. Because of the low water ford, use would be restricted to low water periods to minimize sediment generation and turbidity impacts to Peak Creek. If dry passage is achieved, haul would be allowed between May 1 and October 31, otherwise haul would be restricted to the in-water timing (July 1 to August 31).

2.5 Alternative 3 – An Alternative Timber Haul Route (Buck Peak Road) would be utilized.

The alternative timber haul route would utilize the Buck Peak Road (Roads 14-7-5, 13-6-29 and 14-6-9.1) as the timber haul route. Timber hauling would be allowed year-round on rock surfaced roads except where the surface is deeply rutted or covered by a layer of mud and where runoff is causing a visible increase in turbidity to adjacent streams.

2.6 Alternatives Considered but not Analyzed in Detail

Reflector Timber Sale Project Area:
An alternative to perform density management on approximately 51 acres, conifer release on approximately 27 acres and construct approximately 3,600 feet of road within Township 14 South., Range 8 West., Section 1 (Reflector Project Area) was considered and analyzed. It was determined the cost of the new road construction in conjunction with the relatively small amount of timber to be removed would have resulted in a high likelyhood for a no-bid timber sale.

No New Road Construction:
An alternative proposed by Oregon Wild without new road construction was considered. Without new road construction the potential density management areas would be substantially reduced from the 768 acres for Project 1 to approximately 440 acres. During project planning, the Revised Upper and Lower Alsea River Watershed Restoration IDT strived to minimize new road construction on these projects. Harvest reconnaissance indicates approximately 3 miles of new road construction would be necessary for operability due to topography constraints present in the project areas. The majority of new road is located on ridge tops, generally outside riparian reserves, and no new construction would cross any existing stream channels. Due to this substantial decrease in density management area, this alternative was not analyzed in detail.

Map 2

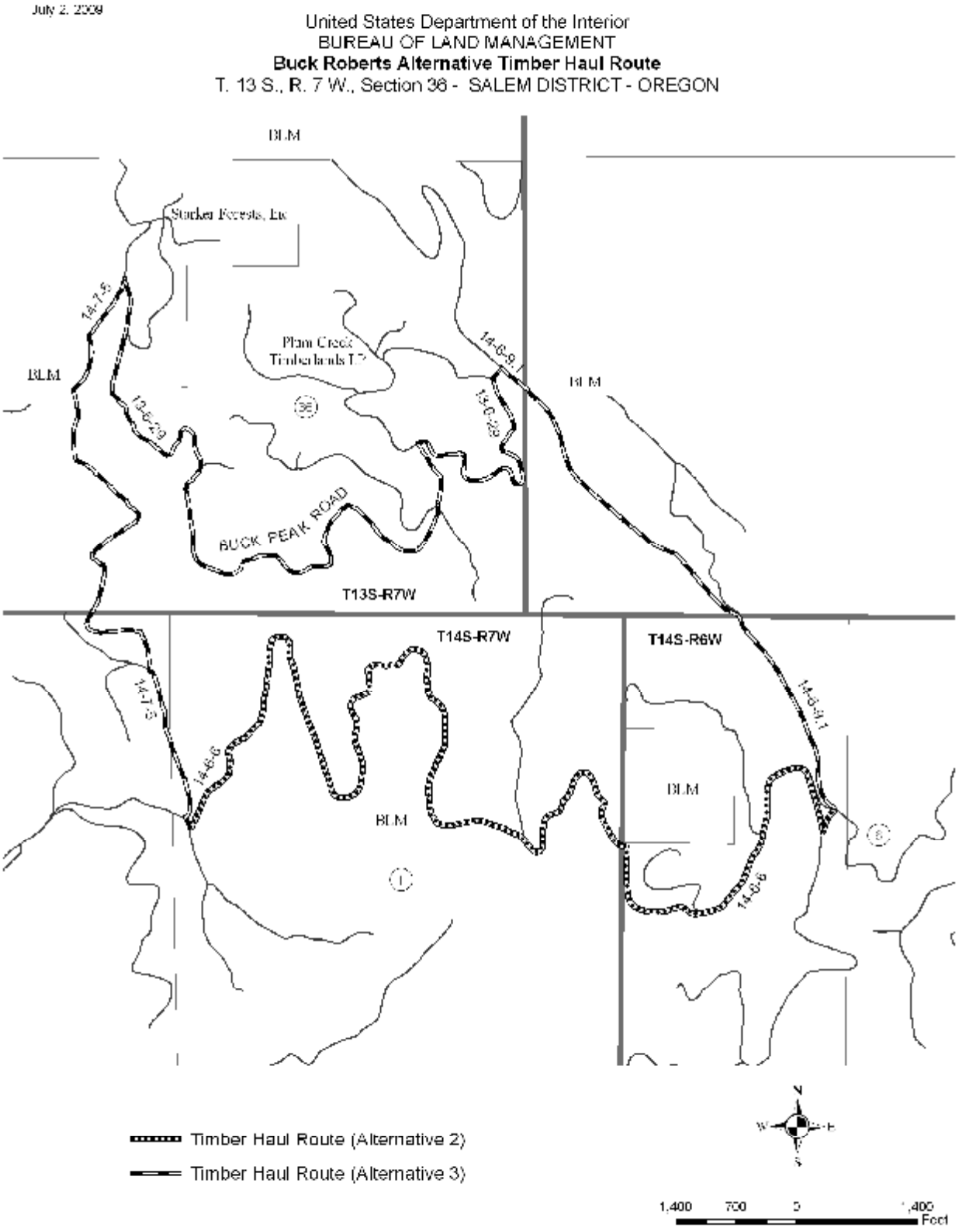

July 2, 2009
United States Department of the Interior
BUREAU OF LAND MANAGEMENT
Buck Roberts Alternative Timber Haul Route
T. 13 S., R. 7 W., Section 36 - SALEM DISTRICT - OREGON
BLM
Stocker Forests, Inc
14-7-5
Plum Creek Timberlands L.P.
14-6-9.1
BLM
BLM
13-6-29
13-6-29
36
BUCK PEAK ROAD
T13S-R7W
T14S-R7W
T14S-R6W
14-7-5
14-6-6
14-6-9.1
BLM
BLM
1
6
14-6-6
Timber Haul Route (Alternative 2)
Timber Haul Route (Alternative 3)
N
W
E
S
1,400
700
0
1,400
Feet

Table 4: Summary Comparison of Project Activities for Alternatives 1, 2 and 3

Activity	Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3 (Alternate Timber Haul Route)
Mid-Seral Enhancement (Project 1) harvest acres	0	768	768
Conifer Release (Project 2) acres	0	42	42
Ground based yarding (acres)	0	183	138
Skyline yarding (acres)	0	433	457
Helicopter yarding (acres)	0	194	187
Road construction (miles)	0	3	3
Roadside Hazard Tree Removal (miles)	0	3.4	0.6
Road Renovation (miles)	0	30	30
Road renovation (culverts to be installed/replaced)	0	54	44

2.7 COMPARISON OF ALTERNATIVES WITH REGARD TO PURPOSE AND NEED

Table 5: Comparison of Alternatives by Purpose and Need
Project 1 Only

Purpose and Need (EA Section 1.6)	Alternative 1 (No Action)	Alternative 2 (Proposed Action) and Alternative 3 (Alternate Timber Haul Route)
Develop, accelerate, and enhance late-successional forest conditions, which serve as habitat for late-successional forest species (LSRA, p. 2).	Maintains a highly dense, uniform, small diameter stand of trees with receding crown ratios, loss of limbs and loss of growth.	Treatment includes variable density thinning, creation of small gaps around "open grown" trees, and retention of small clumps. This would increase spatial and structural diversity of the stand.
Plan and implement silvicultural treatments inside Late-Successional Reserves that are beneficial to the creation of late-successional habitat (RMP p. 16).	Understory regeneration, shrubs etc. would be lacking. The current pattern of habitat use by wildlife species within these project areas would be expected to continue unchanged. Dispersal habitat conditions for spotted owls would remain unchanged.	In the short-term, increases horizontal spatial variability within treated stands (gaps and clumps); minor reduction and disturbance to existing CWD material (snags and down logs) resulting from felling, yarding, and road construction. Reduced recruitment rate of small sized CWD would be partially offset by immediate creation of larger CWD of desirable size, and augmentation of decadence processes; retention of hardwood tree and shrub diversity.
Conduct thinning operations in forest stands if needed to create and maintain late successional forest conditions (RMP p. 16).	No timber harvest would occur consequently no spatial and structural diversity would occur.	In the long-term, the gradual transition in structural characteristics of the treated stands would more closely resemble late-seral forest (larger diameter trees and limbs, sub-canopy development, greater tree species diversity, greater volume and size of hard CWD, canopy gaps); and extends persistence of hardwood tree and shrub cover diversity. The harvest input would likely result in a gain of 200 cubic feet per acre of CWD in skyline yarding areas and about 100 cubic feet per acre in ground-based yarding areas. Spatial and structural diversity would be increased.

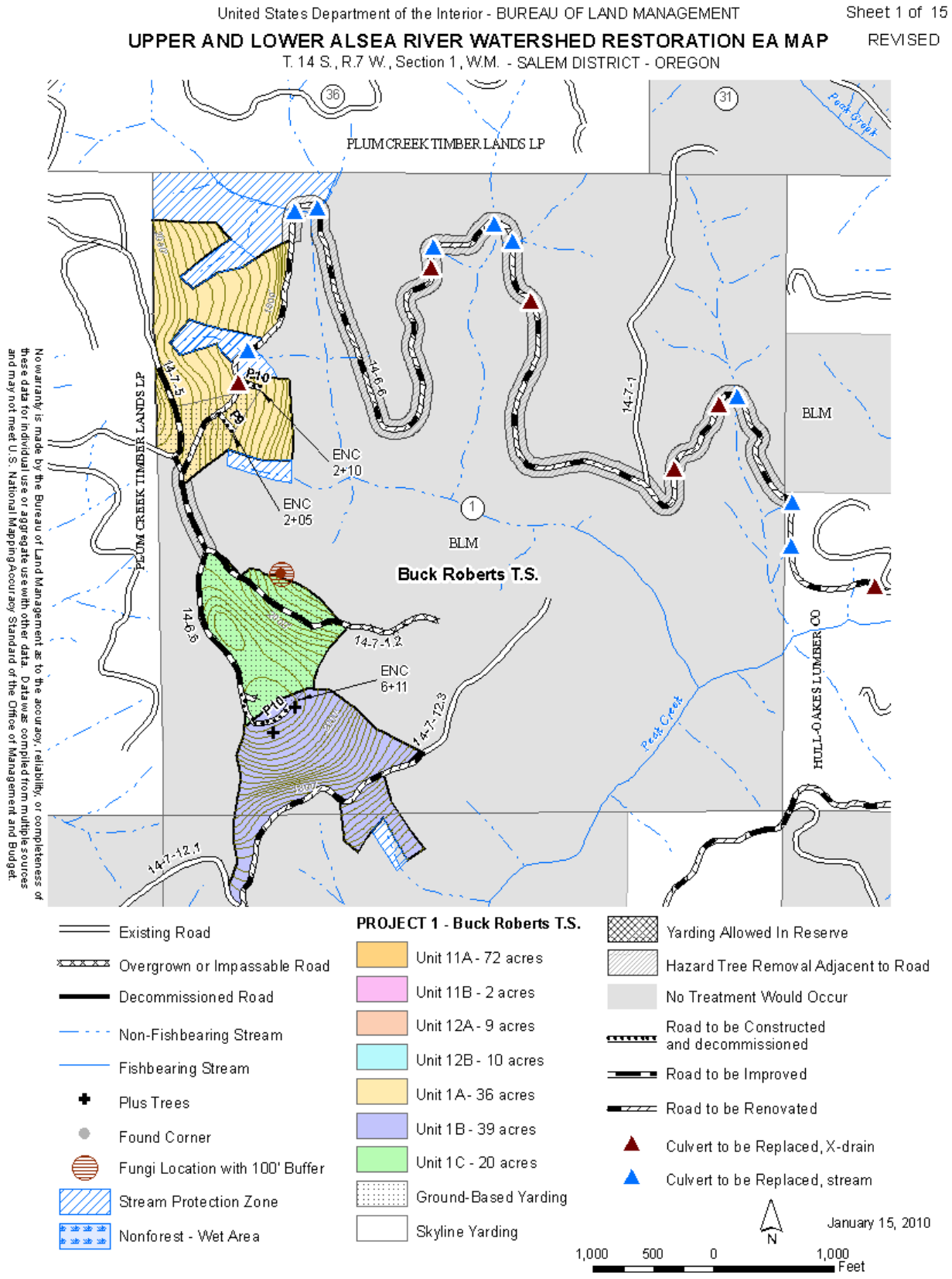
Purpose and Need (EA Section 1.6)	Alternative 1 (No Action)	Alternative 2 (Proposed Action) and Alternative 3 (Alternate Timber Haul Route)
Accelerate the growth of trees to restore large conifers to Riparian Reserves (RMP p.7) Enhance or restore habitat (e.g. CWD, snag habitat, in-stream large wood) for populations of native riparian-dependent plants, invertebrates, and vertebrate species (RMP p.7).	Without treatment, stand structure would remain relatively uniform, except for gaps created by disturbance. The main input of CWD would come from density mortality, disturbance events and endemic levels of insects and disease and would result in more snags and downed logs than with treatment. In general, the quantity of mortality would be much greater than if the stands were thinned, but dead trees would be smaller in size.	The proposed action would retain trees which would reach larger diameters earlier compared to the no treatment option, creating natural opportunities for higher quality LWD recruitment in the long-term. Inputs resulting from harvest consist of limbs and tops, breakage and cull and incidentally felled or topped trees that would be left on site. The harvest input would likely result in a gain of 200 cubic feet per acre of CWD in skyline yarding areas and about 100 cubic feet per acre in ground-based yarding areas. In the long term, due to increased diameter growth resulting from density management, larger trees would be available for recruitment for CWD.
Provide appropriate access for timber harvest and silvicultural practices used to meet the objectives above. Reduce environmental effects associated with identified existing roads within the project area.	Maintain existing road densities. Maintain existing drainage and road surface conditions. Delay maintenance on feeder roads, main routes would be maintained.	Constructs 3 miles of new roads. Following harvest, the new construction would be decommissioned. Renovates 30 miles of existing roads (includes drainage structure installation/replacement/removal on cross drains and stream crossing). These renovations would improve drainage and road surface conditions, resulting in less road surface erosion into streams.

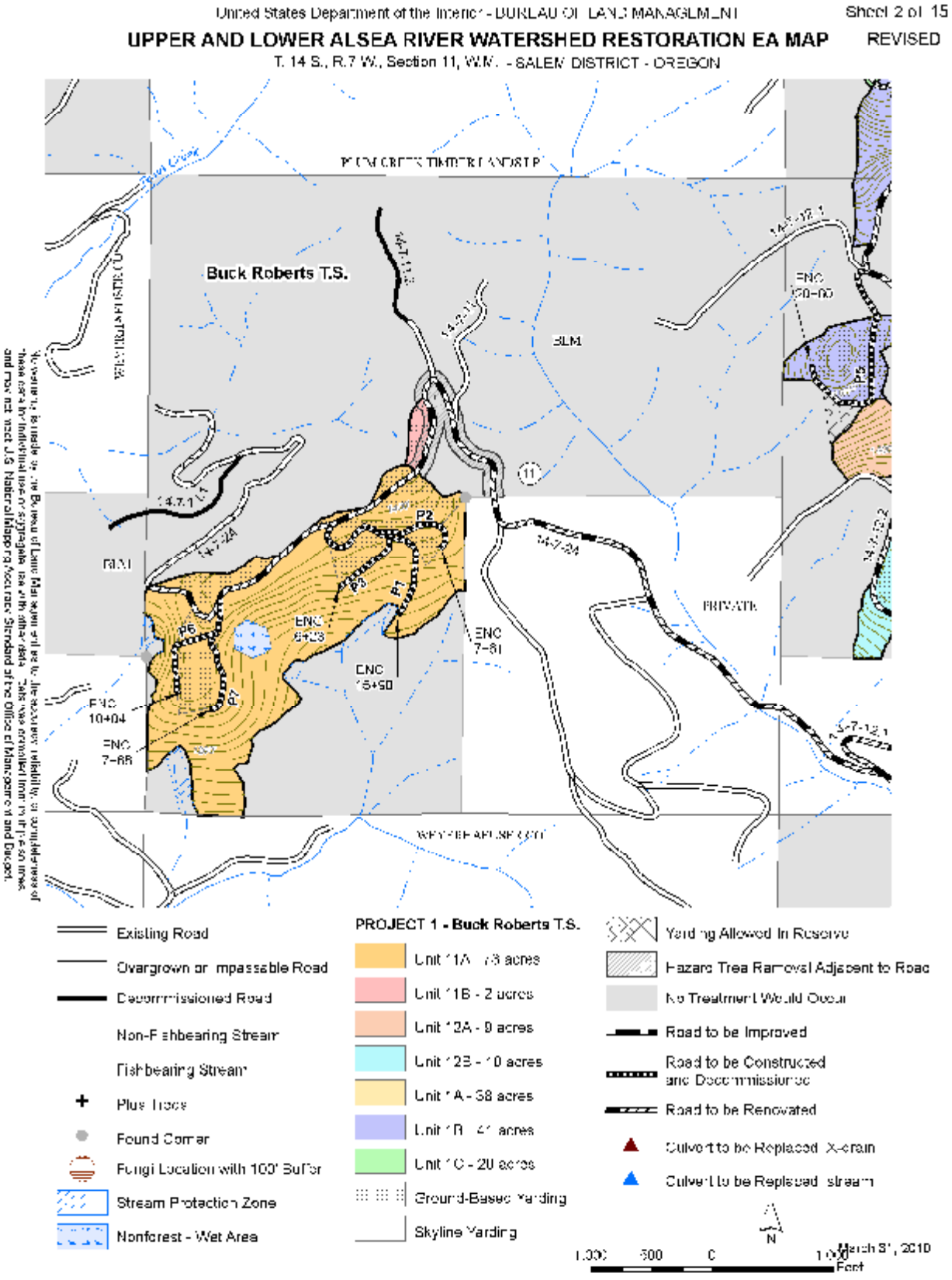
Table 6: Comparison of Alternatives by Purpose and Need
Project 2 Only

Purpose and Need (EA Section 1.6)	Alternative 1 (No Action)	Alternative 2 (Proposed Action)
Develop, accelerate, and enhance late-successional forest conditions, which serve as habitat for late-successional forest species (LSRA, p. 2). Plan and implement silvicultural treatments inside Late-Successional Reserves that are beneficial to the creation of late-successional habitat (RMP p. 16).	Creates high level of small size CWD for the next decade or two in all stands within the project areas.	Complexity would be improved by increasing the proportion of conifer in the stand, increasing species diversity, allowing the conifer ample growing space, and reducing hardwood density in a portion of the stands. This would allow the development of large conifer trees, variable density of hardwoods, tree regeneration, and development of a multi-story stand.
Accelerate the growth of trees to restore large conifers to Riparian Reserves (RMP p.7) Enhance or restore habitat (e.g. CWD, snag habitat, in-stream large wood) for populations of native riparian-dependent plants, invertebrates, and vertebrate species (RMP p.7).	Expected benefits of thinning riparian stands, accelerating the growth rates of retained timber subsequently increasing the average diameters of trees available for future LWD recruitment would not be realized. Impacts to aquatic habitat would be unlikely with the implementation of the no-action alternative.	Complexity would be improved by increasing the proportion of conifer in the stand, increasing species diversity, allowing the conifer ample growing space, and reducing hardwood density in a portion of the stands. This would allow the development of large conifer trees, variable density of hardwoods, tree regeneration, and development of a multi-story stand. In the long term, trees would reach large diameters earlier compared to the no treatment option, creating natural opportunities for high quality LWD recruitment. Large amounts of smaller wood would continue to fall from within the untreated SPZs, and larger wood would begin to be recruited from farther up the slopes as the treated stands reach heights of 200 feet. Thus, wood with a larger range of sizes would potentially be recruited into streams over the long term in treated stands. Since these stands are dominated by hardwood, and only a few conifers are

Purpose and Need (EA Section 1.6)	Alternative 1 (No Action)	Alternative 2 (Proposed Action)
		growing well, there is little long-term potential to create large-diameter conifer CWD. Improving the survival and growth of conifer through treatment would greatly improve the potential.

Map 3: Proposed Action Alternative



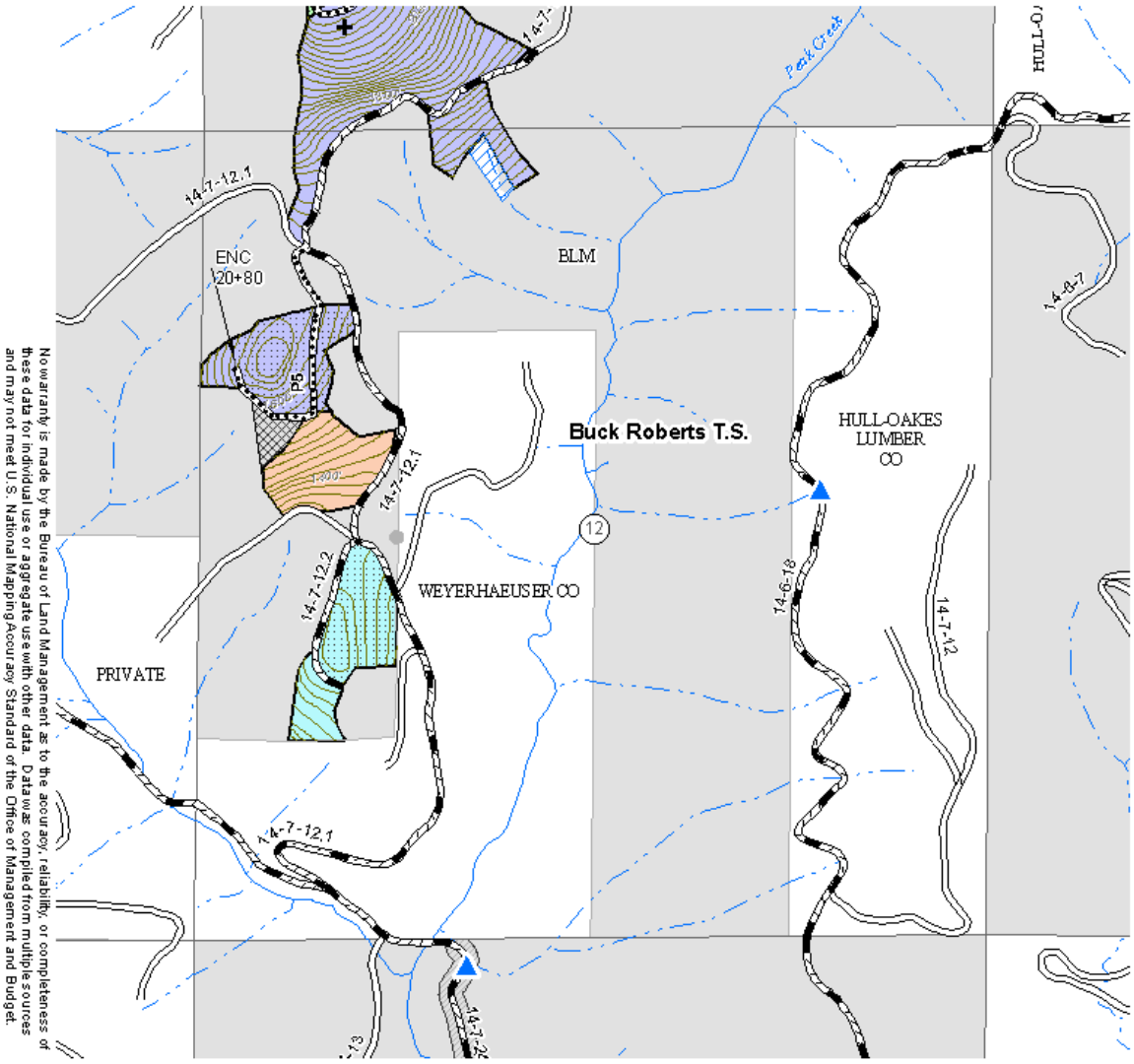

United States Department of the Interior - BUREAU OF LAND MANAGEMENT
Sheet 2 of 15
UPPER AND LOWER ALSEA RIVER WATERSHED RESTORATION EA MAP
REVISED
T. 14 S., R.7 W., Section 11, W.M. - SALEM DISTRICT - OREGON
Buck Roberts T.S.
BLM
PRIVATE
ENC 10+04
ENC 7+88
ENC 8+23
ENC 7+50
ENC 7+81
ENC 20+00
P1
P2
P5
P6
P7
PROJECT 1 - Buck Roberts T.S.
Unit 1A - 73 acres
Unit 1B - 2 acres
Unit 2A - 9 acres
Unit 2B - 10 acres
Unit 3A - 38 acres
Unit 3B - 47 acres
Unit 3C - 20 acres
Ground-Based Yarding
Skyline Yarding
Existing Road
Overgrown or Impassable Road
Decommissioned Road
Non-Fishbearing Stream
Fishbearing Stream
Plus Trees
Found Corner
Fungi Location with 100' Buffer
Stream Protection Zone
Nonforest - Wet Area
Yarding Allowed In Reserve
Hazard Tree Removal Adjacent to Road
No Treatment Would Occur
Road to be Improved
Road to be Constructed and Decommissioned
Road to be Renovated
Culvert to be Replaced - Fish Stream
Culvert to be Replaced - Stream
N
1,000 500 0 1,000 Feet
March 31, 2010

United States Department of the Interior - BUREAU OF LAND MANAGEMENT Sheet 3 of 15

UPPER AND LOWER ALSEA RIVER WATERSHED RESTORATION EA MAP

REVISED

T. 14 S., R.7 W., Section 12, W.M. - SALEM DISTRICT - OREGON



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

- Existing Road
- Overgrown or Impassable Road
- Decommissioned Road
- Non-Fishbearing Stream
- Fishbearing Stream
- Plus Trees
- Found Corner
- Fungi Location with 100' Buffer
- Stream Protection Zone
- Nonforest - Wet Area

PROJECT 1 - Buck Roberts T.S.

- Unit 11A - 72 acres
- Unit 11B - 2 acres
- Unit 12A - 9 acres
- Unit 12B - 10 acres
- Unit 1A - 36 acres
- Unit 1B - 39 acres
- Unit 1C - 20 acres
- Ground-Based Yarding
- Skyline Yarding
- Yarding Allowed In Reserve
- Hazard Tree Removal Adjacent to Road
- No Treatment Would Occur
- Road to be Constructed and decommissioned
- Road to be Improved
- Road to be Renovated
- Culvert to be Replaced, X-drain
- Culvert to be Replaced, stream

January 15, 2010

N

1,000 500 0 1,000 Feet

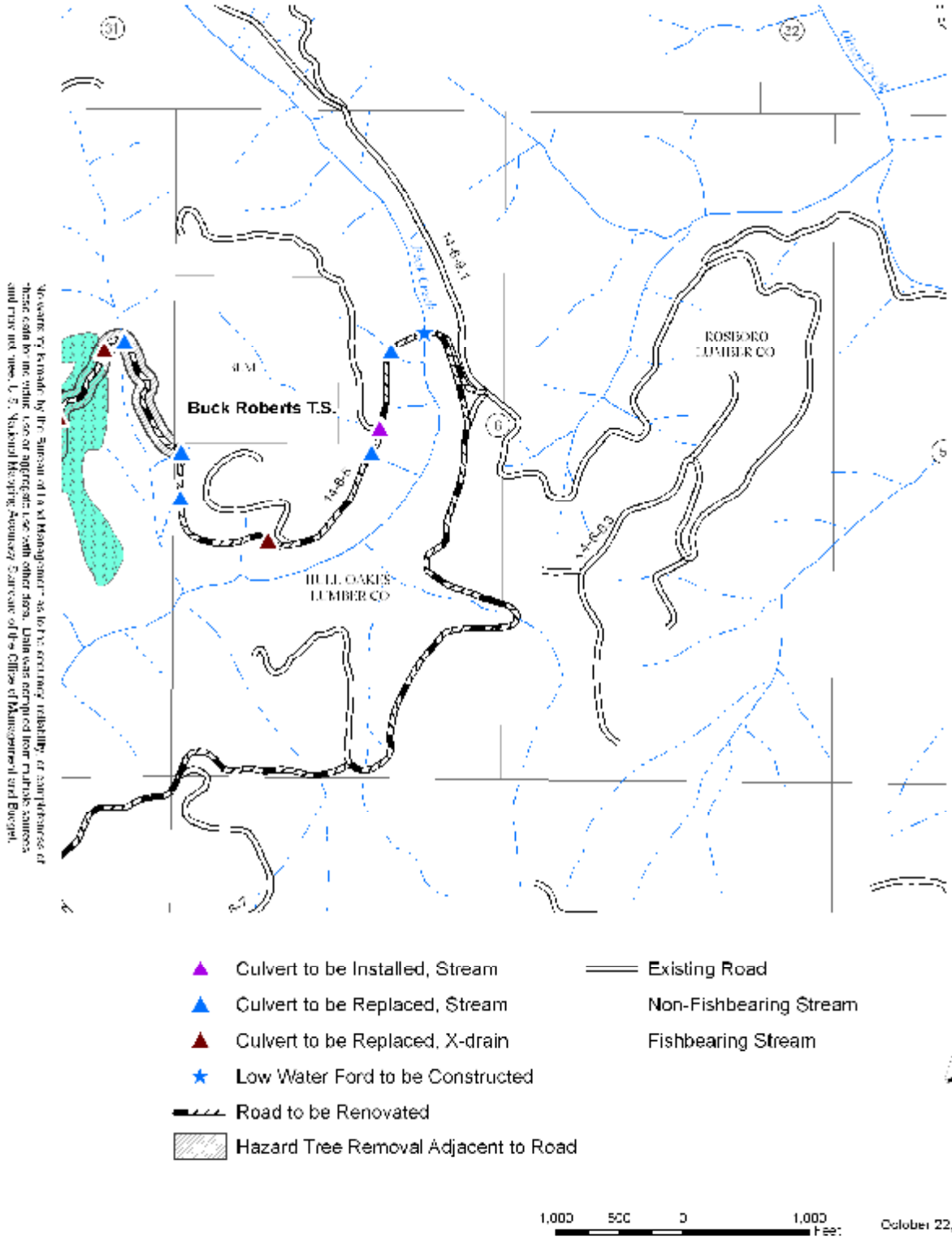
United States Department of the Interior - BUREAU OF LAND MANAGEMENT

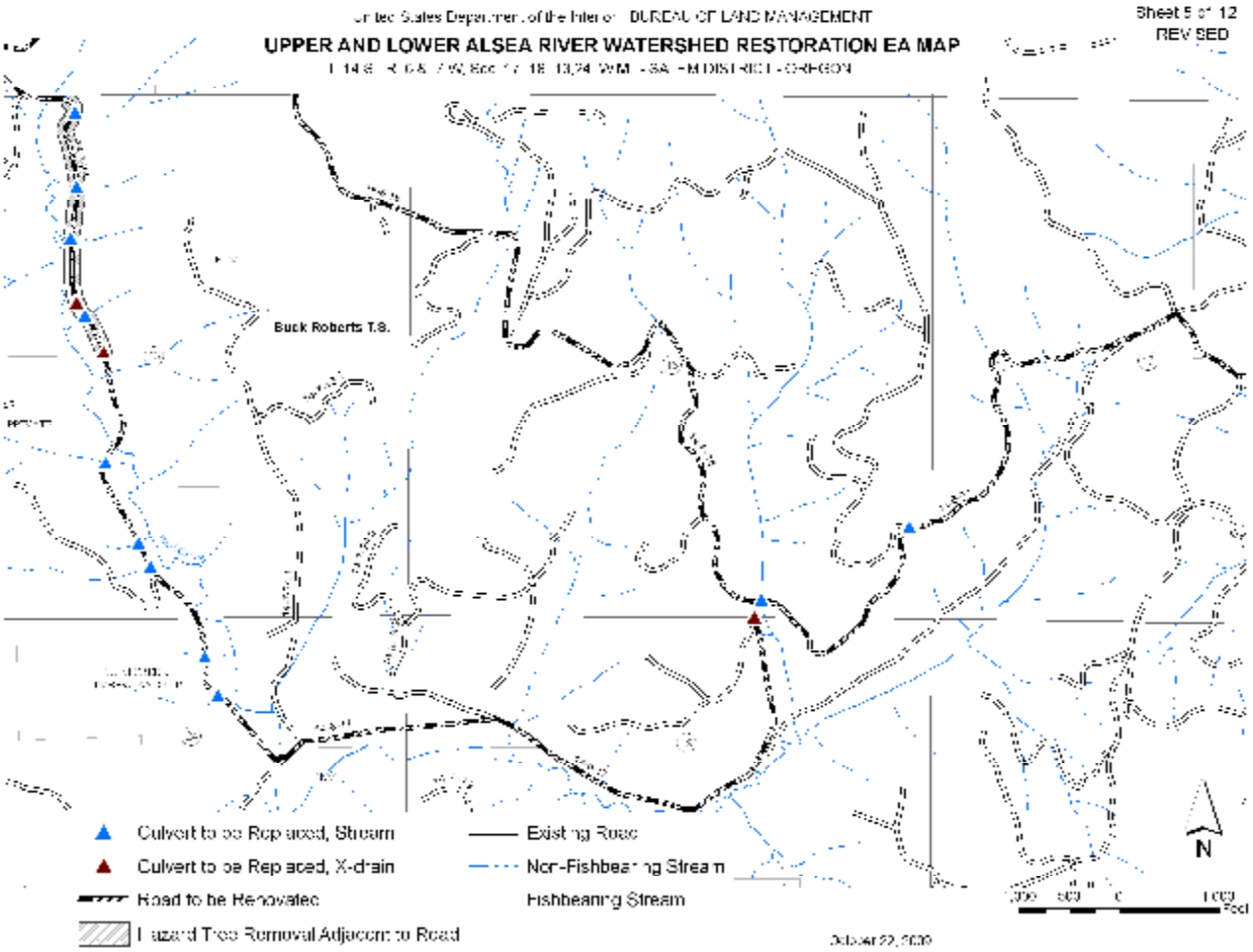
Sheet 4 of 12

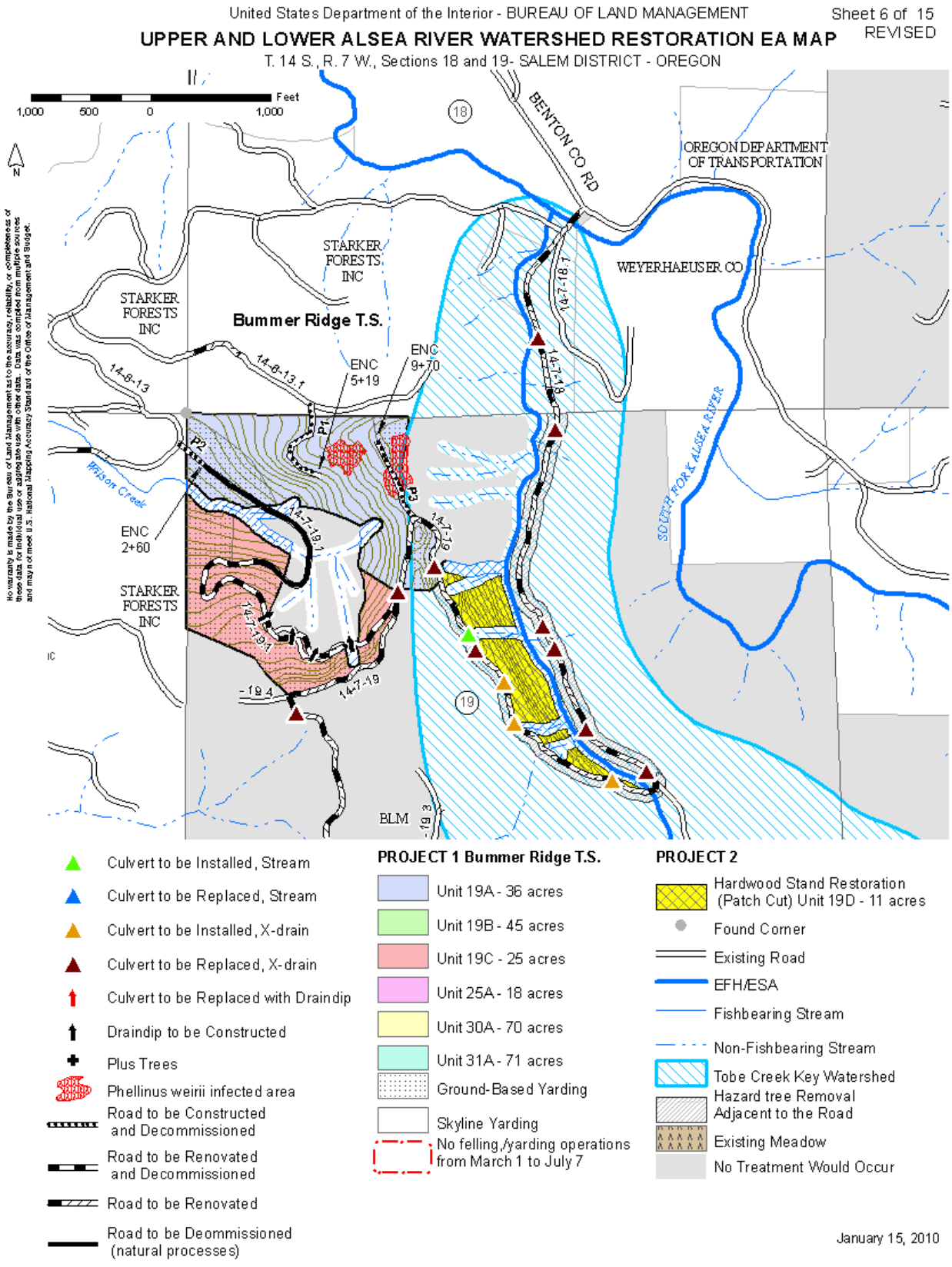
REVISED

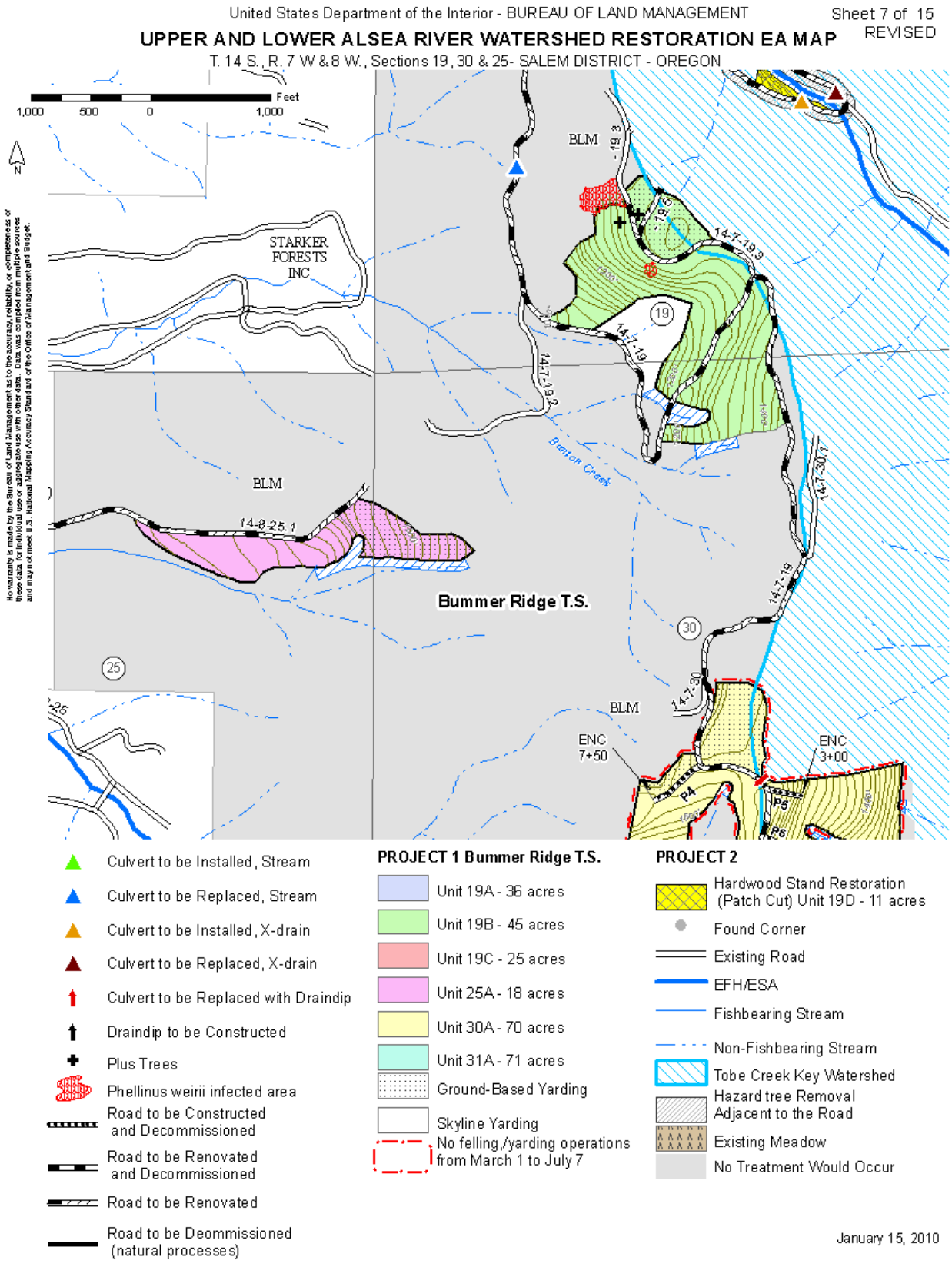
UPPER AND LOWER ALSEA RIVER WATERSHED RESTORATION EA MAP

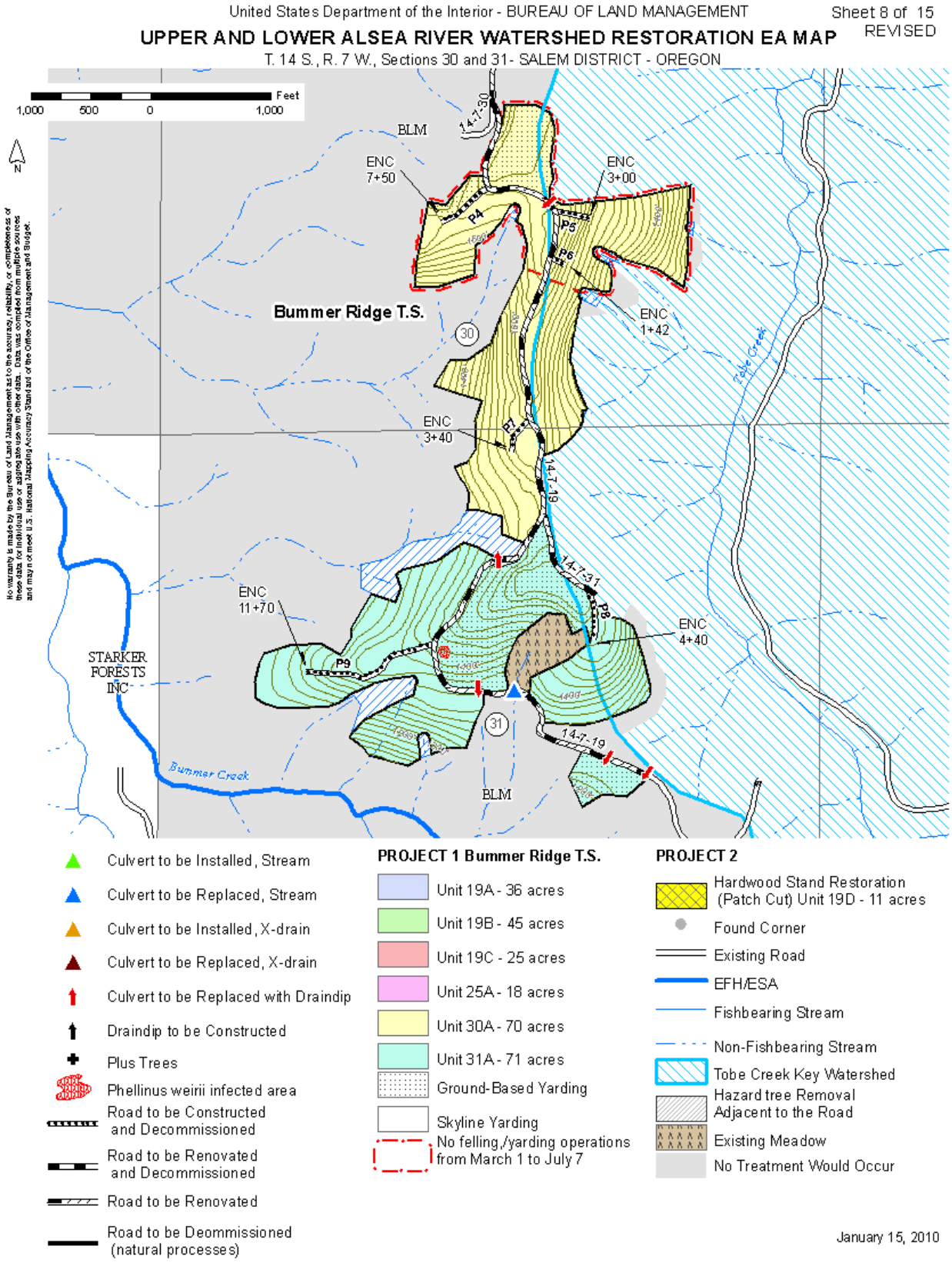
T. 14 S., R.6 W., Section 6, W.M. - SALEM DISTRICT - OREGON




United States Department of the Interior BUREAU OF LAND MANAGEMENT
Sheet 5 of 12
REVISED
UPPER AND LOWER ALSEA RIVER WATERSHED RESTORATION EA MAP
Buck Roberts T.S.
Culvert to be Replaced, Stream
Culvert to be Replaced, X-drain
Road to be Renovated
Hazard Tree Removal Adjacent to Road
Existing Road
Non-Fishbearing Stream
Fishbearing Stream
N
October 22, 2020


United States Department of the Interior - BUREAU OF LAND MANAGEMENT
Sheet 6 of 15
REVISED
UPPER AND LOWER ALSEA RIVER WATERSHED RESTORATION EA MAP
T. 14 S., R. 7 W., Sections 18 and 19- SALEM DISTRICT - OREGON
Feet
1,000 500 0 1,000
N
BENTON CO RD
OREGON DEPARTMENT OF TRANSPORTATION
STARKER FORESTS INC
WEYERHAEUSER CO
Bummer Ridge T.S.
14-6-13
14-6-13.1
ENC 5+19
ENC 9+70
14-7-18.1
P1
P2
P3
Wilson Creek
ENC 2+60
14-7-19
14-7-19.1
SOUTH FORK ALSEA RIVER
BLM
Culvert to be Installed, Stream
Culvert to be Replaced, Stream
Culvert to be Installed, X-drain
Culvert to be Replaced, X-drain
Culvert to be Replaced with Draindip
Draindip to be Constructed
Plus Trees
Phellinus weirii infected area
Road to be Constructed and Decommissioned
Road to be Renovated and Decommissioned
Road to be Renovated
Road to be Deommissioned (natural processes)
PROJECT 1 Bummer Ridge T.S.
Unit 19A - 36 acres
Unit 19B - 45 acres
Unit 19C - 25 acres
Unit 25A - 18 acres
Unit 30A - 70 acres
Unit 31A - 71 acres
Ground-Based Yarding
Skyline Yarding
No felling/yarding operations from March 1 to July 7
PROJECT 2
Hardwood Stand Restoration (Patch Cut) Unit 19D - 11 acres
Found Corner
Existing Road
EFH/ESA
Fishbearing Stream
Non-Fishbearing Stream
Tobe Creek Key Watershed
Hazard tree Removal Adjacent to the Road
Existing Meadow
No Treatment Would Occur
January 15, 2010


United States Department of the Interior - BUREAU OF LAND MANAGEMENT
Sheet 7 of 15
REVISED
UPPER AND LOWER ALSEA RIVER WATERSHED RESTORATION EA MAP
T. 14 S., R. 7 W & 8 W., Sections 19, 30 & 25- SALEM DISTRICT - OREGON
Feet
1,000 500 0 1,000
N
STARKER FORESTS INC
BLM
19
14-7-19.3
14-7-19
14-7-19.2
Braton Creek
14-7-30.1
14-8-25.1
Bummer Ridge T.S.
30
25
14-7-30
ENC 7+50
ENC 3+00
P4
P5
P6
Culvert to be Installed, Stream
Culvert to be Replaced, Stream
Culvert to be Installed, X-drain
Culvert to be Replaced, X-drain
Culvert to be Replaced with Draindip
Draindip to be Constructed
Plus Trees
Phellinus weirii infected area
Road to be Constructed and Decommissioned
Road to be Renovated and Decommissioned
Road to be Renovated
Road to be Deommissioned (natural processes)
PROJECT 1 Bummer Ridge T.S.
Unit 19A - 36 acres
Unit 19B - 45 acres
Unit 19C - 25 acres
Unit 25A - 18 acres
Unit 30A - 70 acres
Unit 31A - 71 acres
Ground-Based Yarding
Skyline Yarding
No felling,/yarding operations from March 1 to July 7
PROJECT 2
Hardwood Stand Restoration (Patch Cut) Unit 19D - 11 acres
Found Corner
Existing Road
EFH/ESA
Fishbearing Stream
Non-Fishbearing Stream
Tobe Creek Key Watershed
Hazard tree Removal Adjacent to the Road
Existing Meadow
No Treatment Would Occur
January 15, 2010

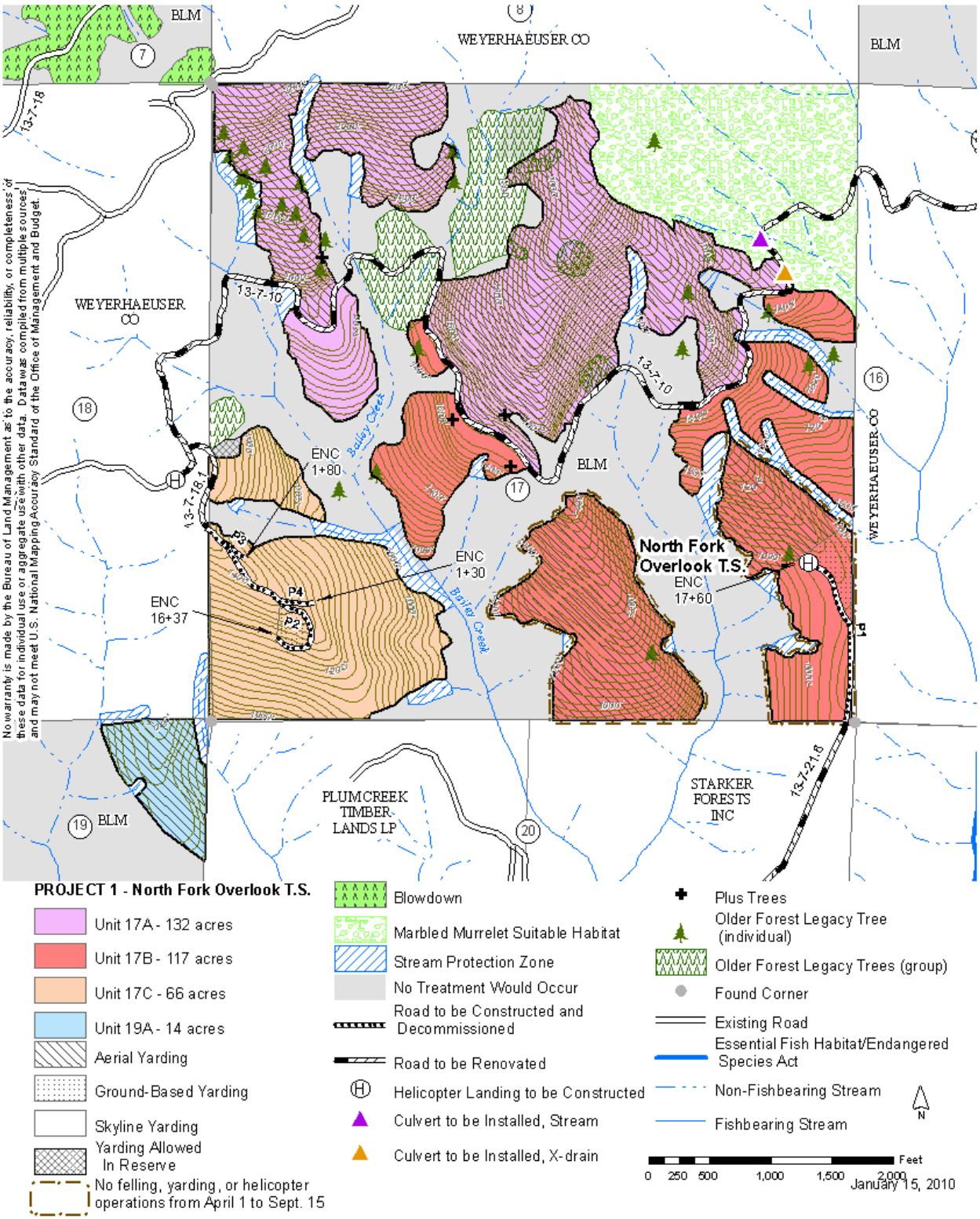

United States Department of the Interior - BUREAU OF LAND MANAGEMENT
Sheet 8 of 15
REVISED
UPPER AND LOWER ALSEA RIVER WATERSHED RESTORATION EA MAP
T. 14 S., R. 7 W., Sections 30 and 31- SALEM DISTRICT - OREGON
Feet
1,000 500 0 1,000
N
BLM
ENC 7+50
ENC 3+00
ENC 1+42
ENC 3+40
ENC 11+70
ENC 4+40
P4
P5
P6
P7
P8
P9
Bummer Ridge T.S.
30
31
14-7-30
14-7-19
14-7-31
STARKER FORESTS INC
Bummer Creek
Tobe Creek
Culvert to be Installed, Stream
Culvert to be Replaced, Stream
Culvert to be Installed, X-drain
Culvert to be Replaced, X-drain
Culvert to be Replaced with Draindip
Draindip to be Constructed
Plus Trees
Phellinus weirii infected area
Road to be Constructed and Decommissioned
Road to be Renovated and Decommissioned
Road to be Renovated
Road to be Deommissioned (natural processes)
PROJECT 1 Bummer Ridge T.S.
Unit 19A - 36 acres
Unit 19B - 45 acres
Unit 19C - 25 acres
Unit 25A - 18 acres
Unit 30A - 70 acres
Unit 31A - 71 acres
Ground-Based Yarding
Skyline Yarding
No felling,/yarding operations from March 1 to July 7
PROJECT 2
Hardwood Stand Restoration (Patch Cut) Unit 19D - 11 acres
Found Corner
Existing Road
EFH/ESA
Fishbearing Stream
Non-Fishbearing Stream
Tobe Creek Key Watershed
Hazard tree Removal Adjacent to the Road
Existing Meadow
No Treatment Would Occur
January 15, 2010

United States Department of the Interior - BUREAU OF LAND MANAGEMENT Sheet 9 of 15

UPPER AND LOWER ALSEA RIVER WATERSHED RESTORATION EA MAP

REVISED

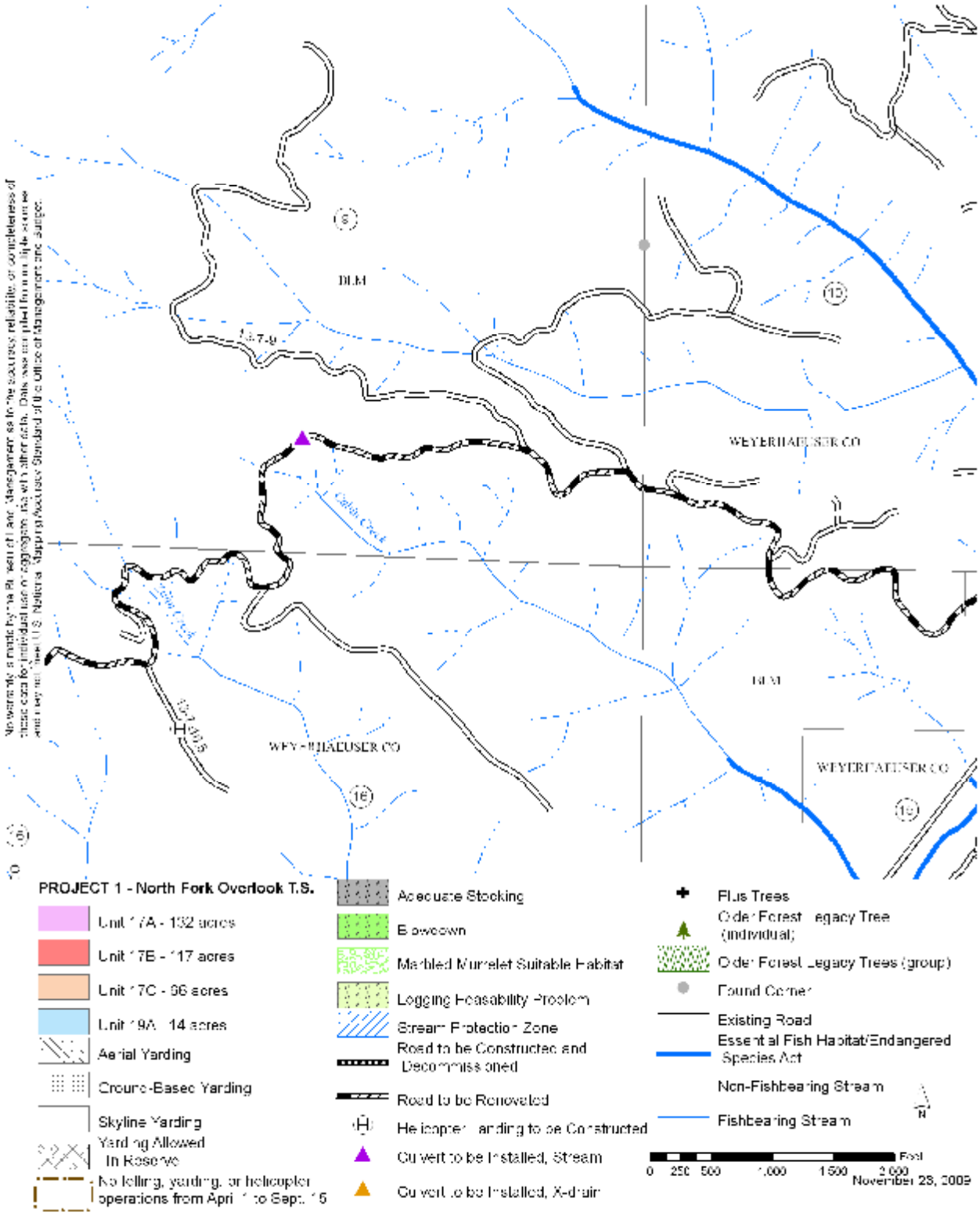
T. 13 S., R. 7 W., Sections 7, 17 and 19, W.M.



United States Department of the Interior - BUREAU OF LAND MANAGEMENT

UPPER AND LOWER ALSEA RIVER WATERSHED RESTORATION EA MAP

T 12 S., R. 7 W., Section 9, 10, 15 and 16 W.M.

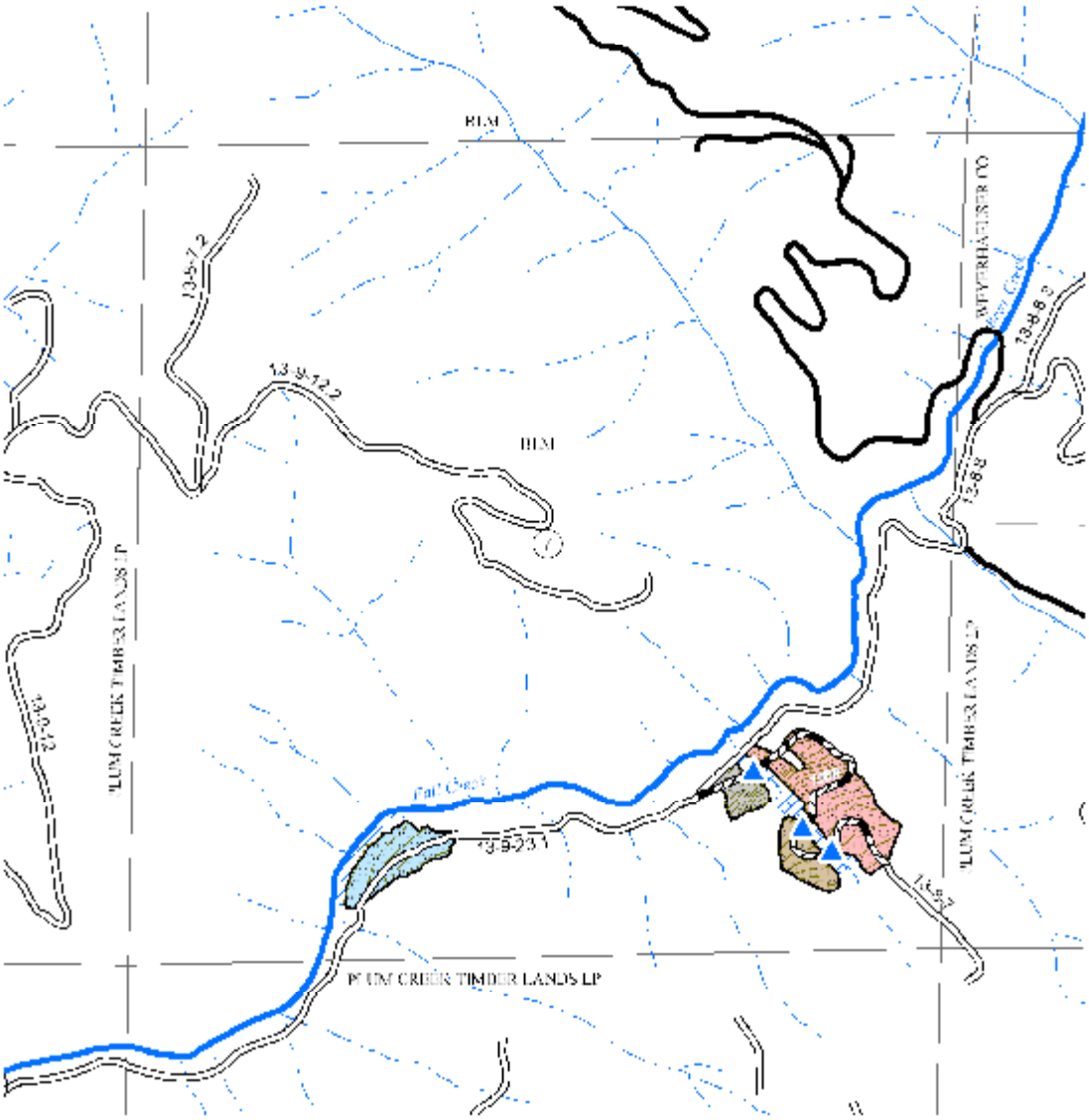


United States Department of the Interior - BUREAU OF LAND MANAGEMENT

UPPER AND LOWER ALSEA RIVER WATERSHED RESTORATION EA MAP

REVISED

T. 13 S., R. 9 W., Section 7, W.M. - SALEM DISTRICT - OREGON



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

N

1,000 500 0 Feet

November 25, 2009

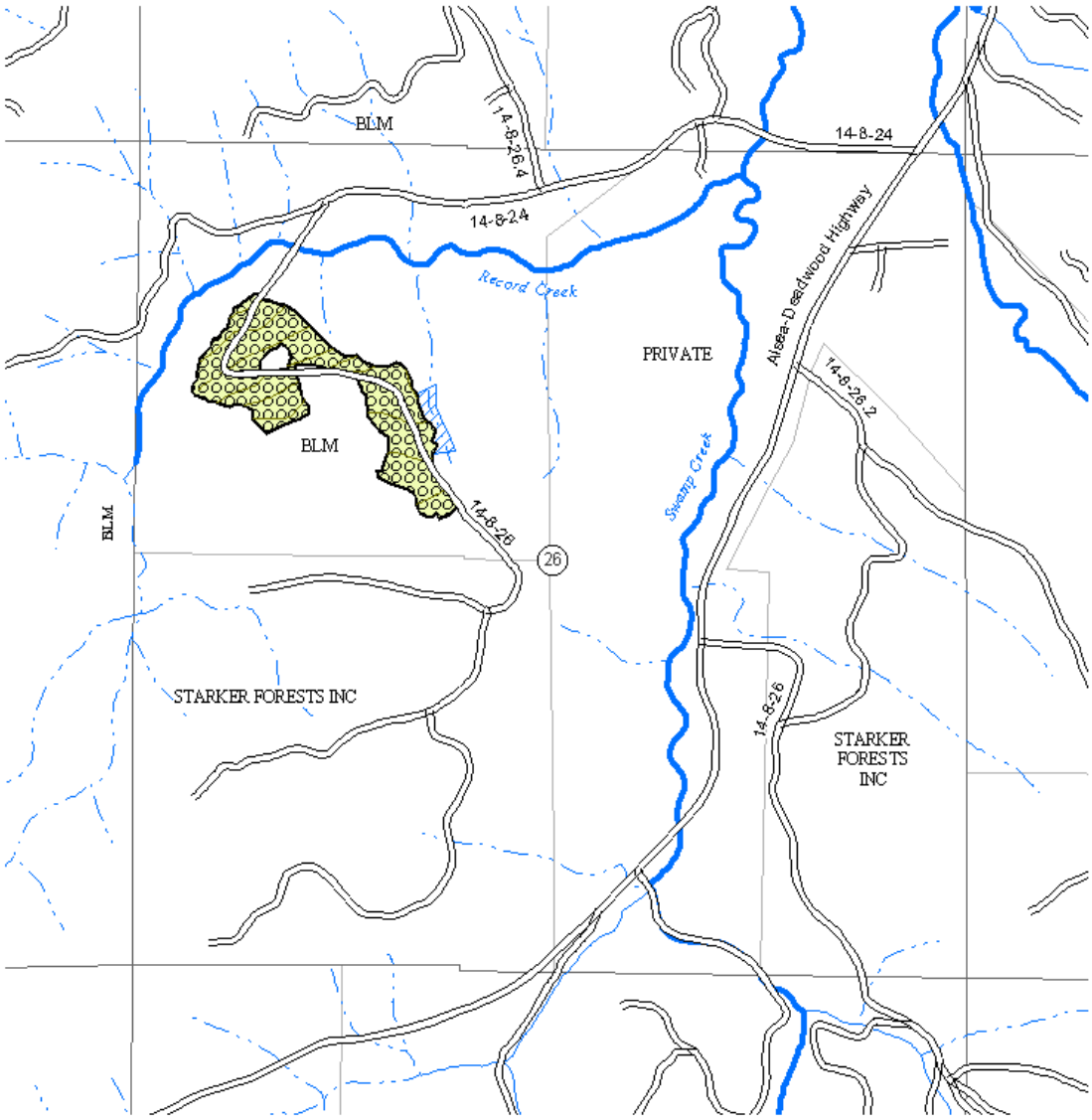
United States Department of the Interior - BUREAU OF LAND MANAGEMENT

Sheet 12 of 15

REVISED

UPPER AND LOWER ALSEA RIVER WATERSHED RESTORATION EA MAP

T. 14 S. R. 8 W., Section 26, W.M. - SALEM DISTRICT - OREGON



Project 2

Conifer Release

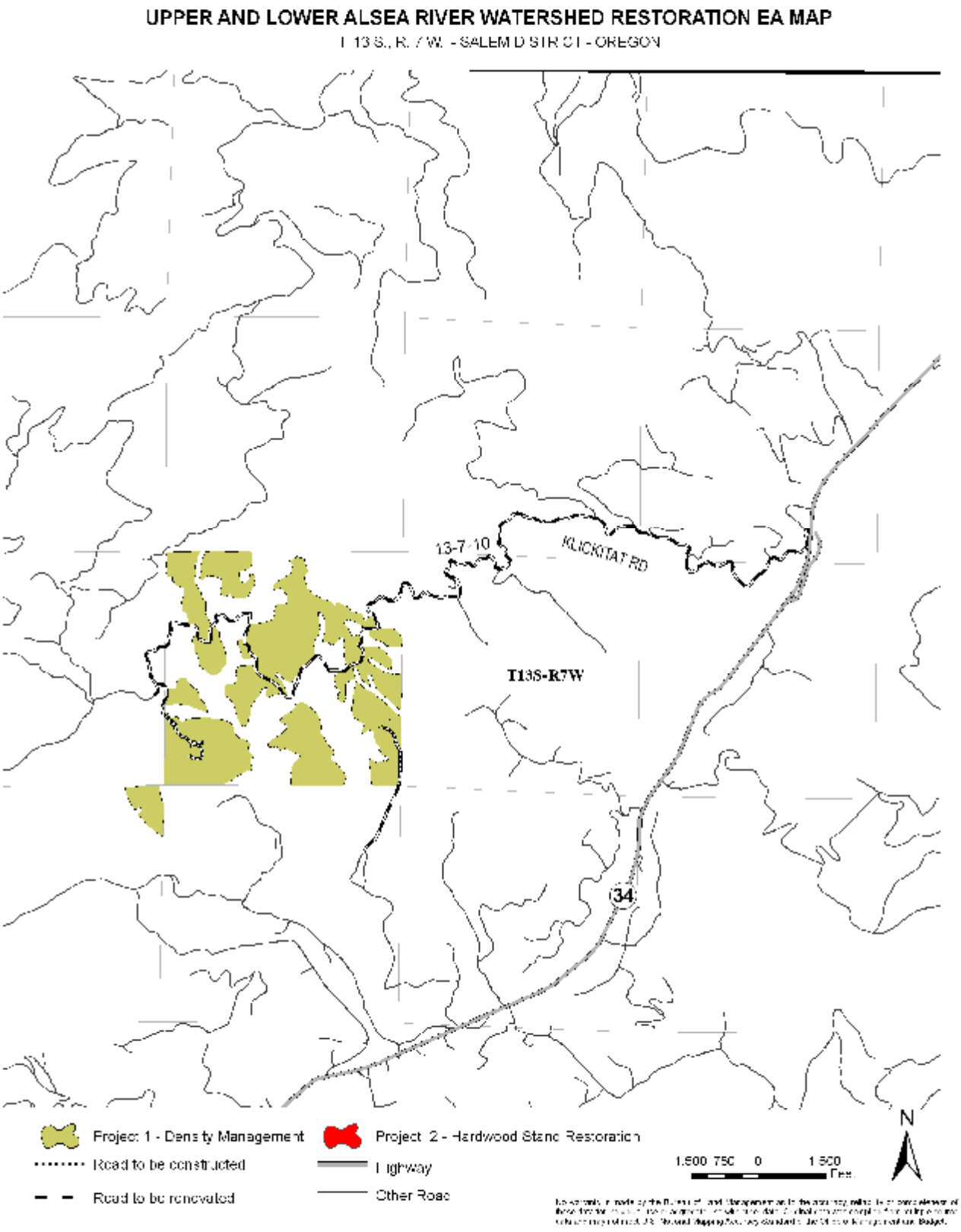
- Unit 26A - 16 acres
- Unit 7A - 7 acres
- Unit 7B - 2 acres
- Unit 7C - 2 acres
- Unit 7D - 4 acres
- Culvert to be Replaced, Stream
- Road to be Renovated
- Existing Road
- Decommissioned Road
- EFH/ESA
- Non-Fishbearing Stream
- Fishbearing Stream
- Stream Protection Zone

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

N

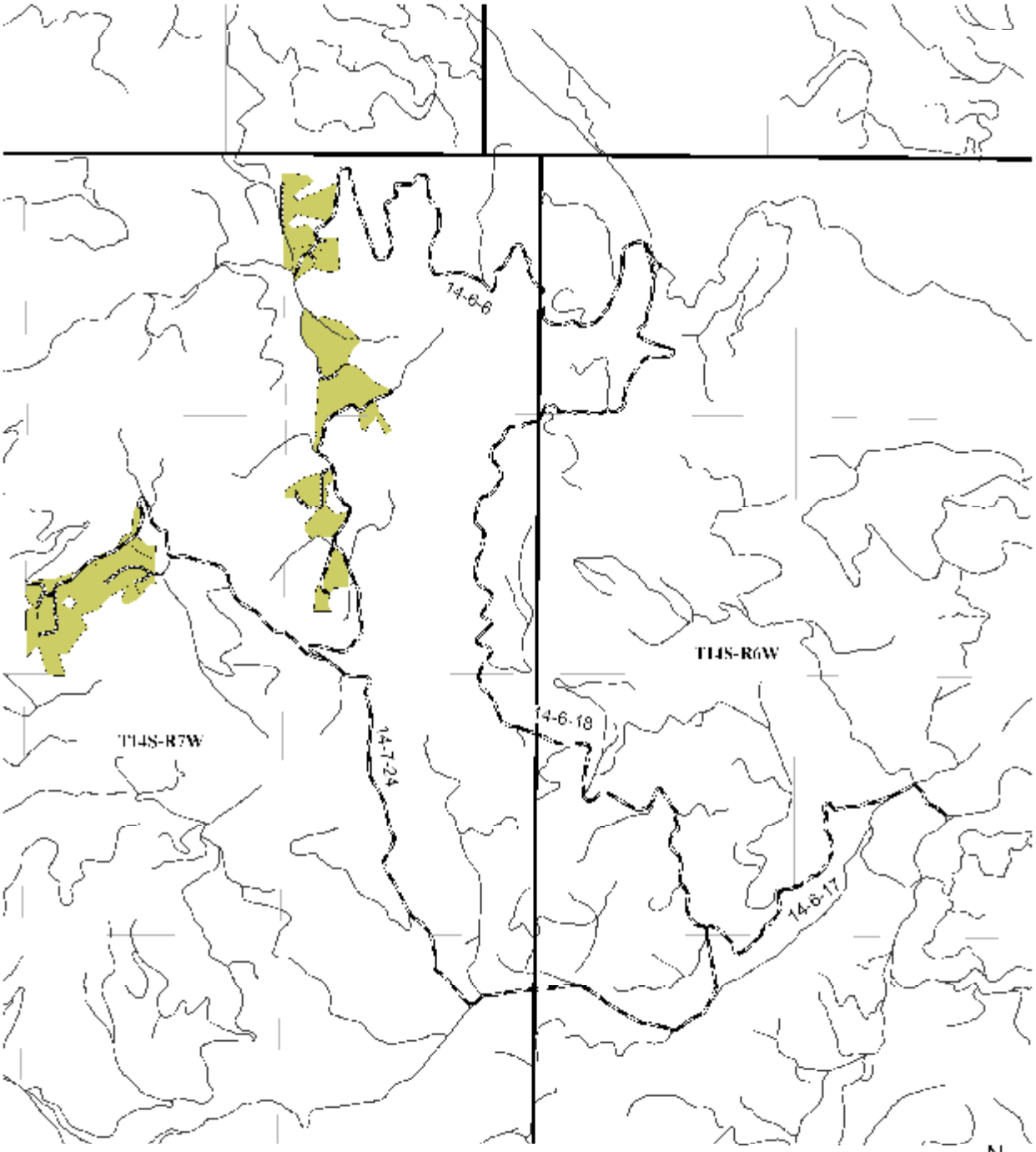
1,000 500 0 1,000 Feet

January 15, 2010


UPPER AND LOWER ALSEA RIVER WATERSHED RESTORATION EA MAP
T 13 S., R. 7 W. - SALEM DISTRICT - OREGON
13-7-10
KLICKITAT RD
T13S-R7W
34
Project 1 - Density Management
Project 2 - Hardwood Stand Restoration
Road to be constructed
Highway
Road to be renovated
Other Road
1,500 750 0 1,500
Feet
N

UPPER AND LOWER ALSEA RIVER WATERSHED RESTORATION EA MAP

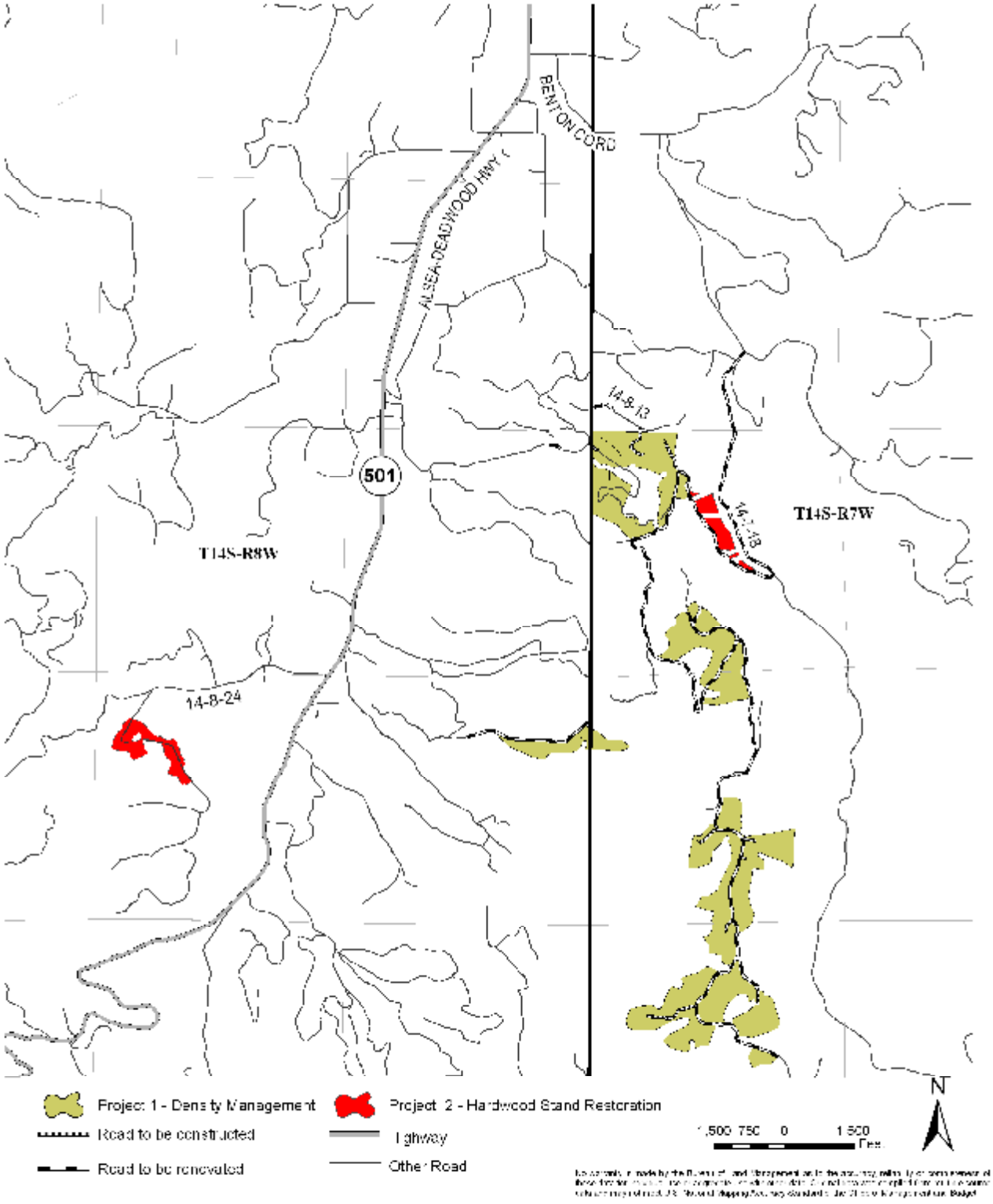
T. 14 S., R. 6 and 7 W. - SALEM DISTRICT - OREGON



November 23, 2009 United States Department of the Interior - BUREAU OF LAND MANAGEMENT Sheet 15 of 15

UPPER AND LOWER ALSEA RIVER WATERSHED RESTORATION EA MAP

T. 14 S., R. 7 and 8 W. - SALEM DISTRICT - OREGON



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

Review of Elements of the Environment Based On Authorities and Management Direction

Table 7: Elements of the Environment Review based on Authorities and Management Direction

Element of the Environment /Authority	Remarks/Effects
Aquatic Conservation Strategy	In compliance with PCFFA IV (Civ. No. 04-1299RSM), this project complies with the Aquatic Conservation Strategy described in the Northwest Forest Plan and RMP. These projects also complies with the PCFFA II (265 F.3d 1028 (9th Cir. 2001)) by analyzing the site scale effects on the Aquatic Conservation Strategy. EA section 5.0 shows how the Upper and Lower Alsea River Watershed Restoration projects meet the Aquatic Conservation Strategy in the context of the PCFFA cases.
Air Quality (Clean Air Act as amended (42 USC 7401 et seq.)	These projects are in compliance with this direction because air quality impacts would be of short duration (one burn period during implementation of pile burning). Addressed in Text (EA Section 3.1.6).
Cultural Resources (National Historic Preservation Act, as amended (16 USC 470) [40 CFR 1508.27(b)(3)], [40 CFR 1508.27(b)(8)]	These projects are in compliance with this direction and the project would have no effect on this element because 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 conducted according to Appendix D of the *Protocol for Managing Cultural Resources on Lands Administered by the Bureau of Land Management in Oregon.* Inventoried areas would be based on percent slope and topographic features
Ecologically critical areas [40 CFR 1508.27(b)(3)]	These projects would have no effect on this element because there are no ecologically critical areas present within the project area.
Energy Policy (Executive Order 13212)	These projects are in compliance with this direction because these projects would not interfere with the Energy Policy (Executive Order 13212).
Environmental Justice (E.O. 12898, "Environmental Justice" February 11, 1994)	These projects are in compliance with this direction because projects would have no effect on low income populations.
Fish Habitat, Essential (Magnuson-Stevens Act Provision: Essential Fish Habitat (EFH): Final Rule (50 CFR Part 600; 67 FR 2376, January 17, 2002)	These projects are in compliance with this direction because NMFSs Biological Opinion (2008) found habitat restoration actions would not result in adverse modification of EFH. Effects to this element are addressed in text (EA Section 3.1.4).
Farm Lands, Prime [40 CFR 1508.27(b)(3)]	The projects would have no effect on this element because no prime farm lands are present on BLM land within the Marys Peak RA.
Floodplains (E.O. 11988, as amended, Floodplain Management, 5/24/77)	These projects are in compliance with this direction because the proposed treatments would not change or affect floodplain functions.

Element of the Environment /Authority	Remarks/Effects
Hazardous or Solid Wastes (Resource Conservation and Recovery Act of 1976 (43 USC 6901 et seq.) Comprehensive Environmental Repose Compensation, and Liability Act of 1980, as amended (43 USC 9615)	These projects would have no effect on this element because no Hazardous or Solid Waste would be stored or disposed of on BLM lands as a result of these projects.
Healthy Forests Restoration Act (Healthy Forests Restoration Act of 2003 (P.L. 108-148)	These projects are in compliance with this direction because treatments would decrease the risk of fire and help restore forests to healthy functioning condition (EA Section 3.1.6).
Migratory Birds (Migratory Bird Act of 1918, as amended (16 USC 703 et seq)	These projects are in compliance with this direction because treatments would restore natural resources that could degrade habitat for migratory birds. Addressed in text (EA Section 3.1.2).
Native American Religious Concerns (American Indian Religious Freedom Act of 1978 (42 USC 1996)	These projects are in compliance with this direction because no Native American religious concerns were identified during the scoping period.
Noxious weed or non-Invasive, Species (Federal Noxious Weed Control Act and Executive Order 13112)	These projects are in compliance with this direction because Project Design Features would prevent establishment of new populations of invasive plant species and because vegetation development would result in decline in both number and vigor of invasive plant populations in the project area. Addressed in text (EA Section 3.1.1).
Park lands [40 CFR 1508.27(b)(3)]	The project would have no effect on this element because there are no parks within or adjacent to the project area.
Public Health and Safety [40 CFR 1508.27(b)(2)]	The project would have no effect on this element because the public would be restricted from the project area during operations and the project would not create hazards lasting beyond project operations.
Threatened or Endangered Species (Endangered Species Act of 1983, as amended (16 USC 1531)	These projects are in compliance with this direction because there would be no adverse effects on Threatened or Endangered Species (EA Section 3.1.2 and 3.1.4).
Water Quality –Drinking, Ground (Safe Drinking Water Act, as amended (43 USC 300f et seq.) Clean Water Act of 1977 (33 USC 1251 et seq.)	These projects are in compliance with this direction because Oregon State water quality standards would be adhered to and the area hydrology would not be changed measurably. Addressed in text (EA Section 3.1.3)
Wetlands (E.O. 11990 Protection of Wetlands 5/24/77) [40 CFR 1508.27(b)(3)]	These projects are in compliance with this direction because wetlands within the project area would be protected by buffers. (EA Section 3.1.3)
Wild and Scenic Rivers (Wild and Scenic Rivers Act, as amended (16 USC 1271) [40 CFR 1508.27(b)(3)]	These projects are in compliance with this direction because there are no Wild and Scenic Rivers within or adjacent to the project areas.
Wilderness (Federal Land Policy and Management Act of 1976 (43 USC 1701 et seq.); Wilderness Act of 1964 (16 USC 1131 et seq.)	These projects are in compliance with this direction because there are no Wilderness Areas or areas being considered for Wilderness Area status in or adjacent to the project areas.

3.1 Affected Environment and Environmental Effects

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

3.1.1 Vegetation

(IDT Reports incorporated by reference: Forest Vegetation and Silviculture Specialist Report Abstract, Revised Upper and Lower Alsea River Watershed Restoration projects pp. 1 to 29, and Revised Upper and Lower Alsea River Watershed Restoration Botanical Report pp.1 to 10)

Affected Environment

Mid-Seral Enhancement (Project 1)

Present Stand Condition and History

Bummer Ridge Project Area

The proposed treatment area consists of 6 fully stocked forest stands dominated by Douglas-fir small sawtimber (11 to 20 inches DBHOB). The trees originated with natural regeneration in the late 1930's to 1960's after timber harvest. In Unit 19B, there are a scattering of Douglas-fir trees that originated before the majority, as they are relatively large, full-crowned and open-grown. In Unit 19C, there is a large component of red alder. There are very few understory trees (greater than 7.0 inches DBHOB) in these stands. Units 19B and 25A have a few clumps of Douglas-fir understory, and Unit 19C contains scattered understory bigleaf maple.

North Fork Overlook Project Area

The project area consists of 4 fully stocked forest stands dominated by Douglas-fir small sawtimber (11 to 20 inches DBHOB). The average tree height is 141 feet and ranges from 130 feet (Unit 17A) to 153 feet (Unit 19A).

The stands originated with natural regeneration in the late 1930s to early 1940s after the Alsea Mountain fire of 1931. There are individual trees and a few groups of large, full-crowned Douglas-fir ("legacy trees") that survived the fire. These number less than one per acre, have very scattered distribution, and are up to 60 inches DBHOB and an estimated 150 to 200 years old. All of the project stands are dominated by Douglas-fir, and only in Unit 17A was western hemlock found. However, there are a few western red cedar and western hemlock found in the understory; and on ridgetops and upper slopes, clumps of golden chinquapin and Pacific madrone can be found. In addition, there are a few bigleaf maple in moist areas and red alder along the streamsides.

There are very few understory trees in these stands – sample plots averaged fewer than ten per acre, ranging from zero to sixteen. These are mostly Douglas-fir and western hemlock, but in Unit 17C, western red cedar was most common in the understory.

Buck Roberts Project Area

The proposed treatment area consists of 7 fully stocked forest stands dominated by Douglas-fir small sawtimber (11 to 20 inches DBHOB). The trees originated with natural regeneration in the late 1940's to 1950's and with planting in the 1960's (Unit 1C) after timber harvest. In Units 1B, 11A, and 12A there are a scattering of Douglas-fir trees that originated before the majority, as they are relatively large, full-crowned and open-grown. In Unit 1A, western hemlock is the majority species. There is a small component of hardwood in all stands (except Units 1C and 11A) including red alder, bigleaf maple, and golden chinquapin. There are very few understory trees in these stands, with the exception of Unit 1A, where gaps created by *Phellinus weirii* root disease have been filled in by western hemlock and western red cedar saplings (these species are more resistant to the disease than Douglas-fir).

Table 8 Current stand attributes (trees greater than 7 inches DBHOB)

Unit	*Total age*[1]	*Trees/ac*	*Basal area/ac (ft^2)*	*QMD (in.)* [2]	*RDI*[3]	*Canopy cover*[4]	*Site Index (DF)*
Bummer Ridge	50	237	252	13.7	.58	75	128
North Fork Overlook	68	163	264	17.3	.75	83	128
Buck Roberts	52	186	236	13.5	.54	86	140

[1] Stand age in 2009
[2] Quadratic mean diameter - the diameter at breast height (4.5 feet) of the tree of average basal area.
[3] Relative Density Index, the density of trees per acre relative to the maximum density possible (Reineke, 1933).
[4] Canopy cover from stand data analyzed in Organon, SMC v. 8.2 growth model, corrected for crown overlap.
[5] No stand exam, attributes estimated from stand exam data in very similar stands.
[6] Conifer= mix of Douglas-fir, Western red cedar, and Western hemlock.

Coarse Woody Debris

The stands proposed for density management are aged less than 80 years old. Using guidelines from the *Late Successional Reserve Assessment for Oregon Coast Province, Southern Portion*, strategy of developing future CWD, levels of CWD 525 to 2844 cubic feet per acre are recommended. Table 9 displays the volume of downed wood and snags per acre, and the count of snags in the project area. The downed wood volume is a total of all material over the minimum piece size 8 feet in length and 5 inches intersect diameter, snags are those greater than 10 inches DBHOB and 10 feet in height.

Bummer Ridge

Snags greater than 24 inches DBHOB were found in Units 30A and 31A only. Current average CWD volume of 559 cubic feet per acre is far below the mid-range of this level.

North Fork Overlook

Data on downed wood was available only for Unit 19A. However, data collected on sixteen stands in the vicinity (within 2 miles, and of similar stand age and history) is representative of the project area and was used to estimate the downed wood in the project area. There is an average of 43 conifer

snags per acre in the project area, with an average DBHOB of 13.1 inches. Snag values are skewed upward by plot data that included numerous small snags on one or more plots within Units 17A, 17B, and 19A. Field review shows snags are less common over much of the stands. Snags greater than 24 inches DBHOB were found in all units, though they are generally of advanced decay. Current average CWD volume of 5,532 cubic feet per acre is well above the mid-range of this level.

Buck Roberts

Unit 1A contains abundant downed wood and some snags in all decay classes, due to the incidence of *Phellinus weirii* root rot. Current average CWD volume of 1,187 cubic feet per acre is below the mid-range of this level.

Table 9. Coarse Woody Debris Volume Avg (conifer only)

Unit	Total age (yrs)	Down Wood (length in feet)[1]	Down wood volume (cu ft/ac)[2]	Snag Volume (cu ft/ac)[3]	Total volume (cu ft/ac)	Snags per acre	Snag QMD
Bummer Ridge	**56**	**16.7**	**476**	**167**	**559**	**1.5**	**11.6**
North Fork Overlook	**68**	**180**	**4,219**	**1,751**	**5,532**	**43.0**	**13.1**
Buck Roberts	**52**	**1109**	**78**	**145**	**1187**	**4.9**	**12.3**

Forest Health

There are no known threats to forest health beyond the following endemic processes in the proposed project area:

Laminated root rot

Laminated root rot, caused by the fungus *Phellinus weirii* affects less than 5 percent of the Bummer Ridge area, creating small (0.1 to 0.25 acre) openings in most stands, however Units 19A, 19B, and 31A have larger infection centers of up to 2.0 acres. These areas have tree mortality dating from the last few decades as well as recent year's mortality and can be expected to spread outward at a rate of about a foot per year.

Laminated root rot affects less than five percent of the North Fork Overlook area, creating small (0.1 acre) openings in some stands. Unit 17C has numerous infection centers of up to 0.5 acre, and the total affected area is approximately 10 to 15 percent of the unit. Infection centers have tree mortality dating from the last few decades as well as recent year's mortality and can be expected to spread outward at a rate of about a foot per year.

Laminated root rot affects less than five percent of the Buck Roberts area, creating small (0.1 acre) openings in some stands. Unit 1A has numerous infection centers of up to 0.25 acre, and the total affected area is approximately 10 to 20 percent of the unit. Infection centers have tree mortality dating from the last few decades as well as recent year's mortality and can be expected to spread outward at a rate of about a foot per year.

Indian paint fungus

Indian paint fungus caused by the fungus *Echinodontium tinctorium* was found in western hemlock in one Bummer Ridge unit and would remain at low levels due to the limited amount of western hemlock in the area. Indian paint fungus is likely present in western hemlock in Buck Roberts Unit 1A, but was not found. In general it would remain at low levels in the project area due to the limited amount of hemlock in the area.

Red ring rot

In Bummer Ridge, Red ring rot, caused by the fungus *Phellinus pini* is widespread throughout the stands and is evident on scattered mature trees from small conks found on the mid-bole.

Douglas-fir bark beetles

Douglas-fir bark beetles are endemic in the project area. Douglas-fir trees weakened by root disease infection are more likely to be attacked by the beetle (Hadfield 1986). In stands under 100 years old, the risk of mortality to healthy green trees is low, even when beetle populations may be quite high.

Windthrow

The risk of windthrow from severe winter storms always exists, and the upper lee slopes of major southeast- to northwest-running ridges generally experience the highest degree of windthrow in the Oregon Coast Range.

Conifer Release (Project 2)

Present Stand Condition and History

The stands included in Project 2 consist of red alder (about 85 percent by trees per acre) and Douglas-fir (about 15 percent), fully stocked, originating in the 1960's to mid 1970's. These stands originated after conifer timber harvest 40 to 80 years ago, and regenerated primarily to red alder. There are 30 to 40 conifer trees per acre, and many of them are 7 to 10 inches diameter. Saplings can be found but are sparse and were not represented in sampling.

Table 10 Current stand attributes for Project 2 (trees greater than 7 inches DBHOB only).

Unit	*Species*	*Acres*	*Total age*[1]	*Trees /ac*	*Basal area/ac (ft²)*	*QMD (in.)* [2]	*RDI* [3]	*Canopy cover*[4]	*Site Index (DF)*
7A-7D	Douglas-fir			37	24	10.9	.07		
	Red Alder			288	202	11.3	.40		
	Total	**14**	**36**	**325**	**226**	**11.3**	**.47**	**97%**	**139**
19D[5]	Conifer[6]			40	25	10.7	.08		
	Red Alder			265	190	11.5	.40		
	Total	**11**	**45**	**305**	**215**	**11.4**	**.48**	**85%**	**140**
26A	Douglas-fir			38	38	13.6	.10		
	Red Alder			291	211	11.5	.40		
	Total	**16**	**46**	**329**	**249**	**11.8**	**.50**	**81%**	**148**

Coarse Woody Debris
Stands in Project 2 were not sampled for coarse wood. Due to the nature of these stands, coarse wood quantity is low, and primarily consists of hardwood, which decays quite rapidly relative to conifer.

Mid-Seral Enhancement (Project 1) and Conifer Release (Project 2)

Special Status Botanical and Fungal Species
There are no known sites of any bureau special status or survey and manage vascular plant, lichen, bryophyte or fungal species within the proposed project areas nor were any found during field surveys.

Invasive (Noxious Weeds, Invasive Non-native Species)
The following noxious weeds occur in small infestations along the right-of-ways from within or adjacent the project area: bull and Canadian thistles, English ivy, false brome, Himalayan blackberry Scots broom, St. John's wort and Tansy ragwort. A few of these noxious weed infestations occur outside the road prism in the project areas.

Environmental Effects

3.1.1.1 ***Alternative 1 (No Action Alternative)***

Mid-Seral Enhancement (Project 1)

Stand Development

Bummer Ridge/North Fork Overlook/Buck Roberts Project Areas

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

Stand structural conditions would remain on the current trajectory of increasing density and decreasing individual tree growth rates.

Without treatment, stand structure would remain relatively uniform, except for gaps created by disturbance. The main input of CWD would come from density mortality, disturbance events and endemic levels of insects and disease resulting in more snags and downed logs than with treatment. In general, the quantity of mortality would be much greater than if the stands were thinned, but dead trees would be smaller in size.

Understory development would be very limited: few new understory trees would be established, and existing understory trees would die or slow in growth due to increasing competition.

Relatively large, open-grown trees would continue to lose lower crown due to competition from surrounding trees that established subsequent to them.

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

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

Table 11. Average pre-treatment and post-treatment stand characteristics immediately after thinning stands (trees greater than 7 inches DBHOB only).

Unit / Treatment	Age[1] (yrs)	Pre-treatment					Immediately After Treatment				
		TPA[2]	% DF	BA[3] (sq ft)	QMD (in)[4]	RDI[5]	TPA[2]	% DF	BA[3] (sq ft)	QMD (in)[4]	RDI[5]
Bummer Ridge Avg.	**61**	**229**	**91%**	**309**	**17.3**	**0.75**	**41**	**91%**	**126**	**24.3**	**0.31**
North Fork Overlook	**68**	**164**	**1**	**268**	**17.5**	**0.77**	**0.31**	**39**	**98%**	**23.7**	**22.1**
Buck Roberts	**52**	**211**	**86%**	**270**	**15.4**	**0.62**	**59**	**73%**	**126**	**20.5**	**0.34**

Note: Includes data for trees >7" only, except density mortality TPA includes all trees.
[1] Modeled from stand age in 2009 to 2039, except Unit 19A modeled from stand age in 2011 to 2041.
[2]Trees per acre >7" DBH.
[3] Basal area in square feet: cross-sectional area occupied by tree boles on each acre, a measure of density
[4] QMD=quadratic mean diameter, the DBH of tree of mean basal area.
[5] Relative Density Index, the density of trees per acre relative to the maximum density possible (Reineke, 1933).

Table 12. Stand Characteristics with Treatment vs. No Treatment 30 years in the future (year 2037)[1]

Unit	Tmt. (Residual BA)	Age[1] (yrs)	TPA[2]	% DF (TPA)	BA[3] (Sq.Ft.)	QMD (in.)[4]	RDI[5]	Density Mortality		
								TPA	BA	QMD
Bummer Ridge	**Tmt.**	**91**	**41**	**89**	**198**	**31.1**	**0.45**	**0.4**	**0.7**	**20.1**
	No Tmt	**91**	**155**	**89**	**359**	**21.6**	**0.94**	**32.2**	**21.3**	**11.2**
North Fork Overlook	**Tmt.**	**98**	**35**	**98**	**175**	**29.9**	**0.40**	**0.0**	**0**	**4.8**
	No Tmt.	**98**	**135**	**100**	**319**	**21.0**	**0.84**	**15**	**12**	**11.1**
Buck Roberts	**Tmt.**	**82**	**59**	**76**	**200**	**26.0**	**0.49**	**2.1**	**2.5**	**10.6**
	No Tmt.	**82**	**166**	**86**	**334**	**19.6**	**0.90**	**41.2**	**27.0**	**10.9**

[1] Modeled from stand age in 2007 to 2037.
[2]Trees per acre greater than 7 inches DBHOB.
[3] Basal area in square feet: cross-sectional area occupied by tree boles on each acre, a measure of density
[4] QMD=quadratic mean diameter, the DBHOB of tree of mean basal area.
[5] Relative Density Index, the density of trees per acre relative to the maximum density possible (Reineke, 1933).

Conifer Release (Project 2)

In Project 2, the predicted mortality without treatment is 189 trees per acre of about 10 inches DBHOB, and only 107 trees of about 10 inches DBHOB with conifer release treatment in that same period.

In Project 2, no tree removal would occur around conifer trees. Some of the smaller conifer may be lost to competition. Those that are overtopped would continue to grow very slowly, have small crowns, and have poor stability due to high ratios of height to diameter. There would be little opportunity to establish more conifer, except in gaps created by natural disturbance. Succession to a greater proportion of conifer would likely occur, but much more gradually than without treatment.

Mid-Seral Enhancement (Project 1) and Conifer Release (Project 2)

Special Status Botanical and Fungal Species
These projects would not affect any other Bureau SS vascular plant, lichen, bryophyte or fungi species since there are no known sites within the project area or adjacent to the project. However, no new habitat for older forest and/or bureau SS species would be created through thinning dense stands of conifers and diversity would remain at the current level for several years until suppressed and co-dominant trees begin to die and allow for an increase of sunlight to the forb and shrub layers.

Invasive (Noxious Weeds, Invasive Non-native Species)

Without implementing these projects the established noxious weed populations would remain at or near the current level, with the exception of false brome.

Any future road maintenance activities not included in this proposed action could provide additional habitat for noxious weeds that currently are established in the project area.

With the exception of false brome, the risk rating for adverse affects from these species would remain low because the known noxious weeds which occur in the project areas are widespread and these project areas are localized within the watersheds.

Without any type of treatment, false brome would continue to spread along the right-of-way systems and into forested areas. The risk rating for the establishment of false brome without any treatment would be low-medium. However, the Marys Peak Resource Area has an integrated non-native plant management plan in place and is prepared to treat some of these existing sites of false brome in 2010. These treatments would reduce the risks of additional infestations.

3.1.1.2 ***Alternative 2 (Proposed Action)***

Mid-Seral Enhancement (Project 1)

Stand Development

Restored structural complexity of the stands
Treatment includes variable density thinning, creation of small gaps around "open grown" trees, and retention of small clumps. This would increase spatial and structural diversity of the stand.

Accelerated development of desired tree characteristics
Residual trees would increase in diameter and crown depth/width. Limb diameter and crown depth would be maintained because trees would be released from competition that causes growth decrease and loss of shaded lower limbs. The predicted average increase in quadratic mean diameter (QMD) for overstory trees as a result of density management thinning would result in an additional 1.9 inch of diameter growth in 30 years, 47 percent more diameter growth than without treatment.

Species Composition
Species diversity would be increased, as thinning would target Douglas-fir, increasing the relative proportion of the other tree species. Furthermore, treatment would promote the establishment of seedlings, which are likely to include hardwood, western hemlock and western red cedar.

Maintenance of stand health and stability
With treatment, the current stand average height to diameter ratios of 68 (calculated from the quadratic mean diameter and the height of the 40 largest trees per acre), would remain the same with 30 years of growth indicating maintenance of relatively good tree stability over time.

Crown ratios, the ratio of a tree's live crown to its total height indicate vigor and capacity to grow. Currently the average of the stands crown ratio is 32 percent. Crown ratios are predicted to fall to an average of 26 percent after 30 years without treatment, and drop slightly to 30 percent in treated stands.

Long-term increase in quality CWD recruitment
Thinning short-circuits the snag recruitment that results from inter-tree competition (Carey, 1999), and very little density mortality (2.1 trees per acre) is expected to occur for 30 years after treatment, and

most of that would be smaller (11 inches DBHOB average) hardwood trees remaining after thinning that are in an overtopped position and are lost from the stand as density increases again following thinning.

Measures to protect existing large snags are likely to be effective, but many of the smaller snags would likely be felled for safety reasons. Inputs resulting from harvest consist of limbs and tops, breakage and cull and incidentally felled or topped trees that would be left on site. The harvest input would likely result in a gain of 200 cubic feet per acre of CWD in skyline yarding areas and about 100 cubic feet per acre in ground-based yarding areas. In the long term, due to increased diameter growth resulting from density management, larger trees would be available for recruitment for CWD.

Effects within Riparian Management Areas

Maintenance of stream temperature through shading

Stream shading would not be affected by the proposed treatments. According to the Stream Shading Sufficiency Analysis (USDA, USFS et. al., 2004) completed for the proposed treatment, SPZs need to be 55 feet wide to provide critical shade in the primary shade zone, based on topography and average tree height. In the secondary shade zone, canopy cover post-treatment would average 60 percent. Understory establishment and growth would contribute to canopy cover as well.

Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands

From research on the BLM Western Oregon Density Management Study (Ares, et al, 2009 and Olson and Rugger, 2007), thinning affects vegetation structure by increasing cover of grasses and forbs and increasing species richness, a measure of diversity. Richness increased because forest floor herb species typically found under forest canopies remained and flourished, and were joined by open-site herbs and grasses not typically found under forest canopies. However, species composition and abundance following thinning is more dependent on composition and abundance prior to treatment than on treatment effects.

In the six year period following treatment, plant communities transitioned from an increased cover of species associated with open sites and early seral stages, to a greater proportion of shade-tolerant forest floor species. For example, cover of grasses and early seral forbs was greatest one year following treatment, and were decreased six years after treatment. Since thinning occurred in riparian reserves within 20 to 50 feet from streams in the sampled areas, these results are applicable to riparian areas and would support thinning to maintain species composition and structural diversity of plant communities.

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

Research (Ares, et al, 2009 and Olson and Rugger, 2007, Norvell and Exeter, 2004, Progar and Moldenke, 2002) has found that thinning treatments generally maintained habitat for native plant, invertebrate and invertebrate riparian-dependant species. Specifically, thinning was found to increase species richness of arthropods, and forest riparian buffers thirty meters wide serve as refuge for both forest-upland and forest-riparian arthropod species. Thinning was found to have minimal effects on most species of aquatic vertebrates including salamanders.

Native plants were found to persist and increase in coverage after density management. Patch openings and wide thinning drastically reduced the diversity of epigeous ectomycorrhizal fungal species, but medium and high retention thinning showed little change in fungal diversity. Buffers of

widths defined by the transition from riparian to upland vegetation or topographic slope breaks appear sufficient to mitigate the impacts of upslope thinning on the microclimate above headwater streams. Because the microclimate, as well as the structure and composition of the forest stand and understory vegetation are protected within the untreated buffer, habitat elements seem to be protected.

Long-term increase in quality instream large woody debris (LWD) recruitment
In the long term, trees would reach large diameters earlier compared to the no treatment option, creating opportunities for high quality LWD recruitment. Large amounts of smaller wood would continue to fall from within the untreated SPZs, and larger wood would begin to be recruited from farther up the slopes as the treated stands reach heights of 200 feet. Thus, wood with a larger range of sizes would potentially be recruited into streams over the long term in treated stands.

Risk assessment
There would be a short-term (one to three years) elevated risk of a bark beetle infestation from the increased fresh down wood. Mortality from bark beetles is very unlikely to reduce tree stocking below desired levels.

The incidence of root disease and heartrot would be unaffected or reduced as a result of treatment. Indian paint fungus would be unaffected and would remain at a low incidence. Laminated root rot would be reduced by removing susceptible trees from around current infection centers, halting the spread of disease.

The potential for windthrow from winter storms would be higher for the first decade following density management.

Skyline and ground-based yarding systems would result in bole and crown damage to a small percentage 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. Restrictions to yarding during the sap-flow period in the spring would reduce damage.

Conifer Release (Project 2)

Stand Development – Project 2
Stand development for 30 years growth after density management under the proposed action and without treatment is compared in Table 12. Conifer release is expected to aid development of stand structure and individual tree characteristics desirable for attainment of composition and structural diversity in the following ways:

Restored structural complexity of the stands
Complexity would be improved by increasing the proportion of conifer in the stand, increasing species diversity, allowing the conifer ample growing space, and reducing hardwood density in a portion of the stands. This would allow the development of large conifer trees, variable density of hardwoods, tree regeneration, and development of a multi-story stand.

Accelerated development of desired tree characteristics
Residual trees would increase in diameter and crown depth/width, as described for Project 1. Modeling shows an increase of 0.8 inches diameter growth above no treatment. However, because the

reduction of competition would be focused primarily on conifer, increase in QMD for conifer trees as a result of treatment is likely to be 2 to 3 inches.

Increased species diversity
Species diversity would be increased, as treatment would target red alder, increasing the relative proportion of the other tree species. Treatment would also promote establishment of seedlings, which are likely to include hardwood, Douglas-fir, western hemlock and western red cedar.

Long term increase in quality coarse woody debris recruitment
Since these stands are dominated by hardwood, and only a few conifers are growing well, there is little long-term potential to create large-diameter conifer CWD. Improving the survival and growth of conifer through treatment would greatly improve the potential.

Long term increase in quality instream large woody debris (LWD) recruitment
In the long term, trees would reach large diameters earlier compared to the no treatment option, creating natural opportunities for high quality LWD recruitment. Large amounts of smaller wood would continue to fall from within the untreated SPZs, and larger wood would begin to be recruited from farther up the slopes as the treated stands reach heights of 200 feet. Thus, wood with a larger range of sizes would potentially be recruited into streams over the long term in treated stands.

Maintenance of stream temperature through shading
Stream shading would not be affected by the proposed treatments. According to the Stream Shading Sufficiency Analysis (USDA, USFS et. al., 2004) done for the proposed treatment, SPZs need to be 55 feet wide (50 feet in one unit of Project 2) to provide critical shade in the primary shade zone, based on topography and average tree height. Additional criteria required for shade sufficient to maintain stream temperatures are that vegetation density is high and would benefit from thinning and that vegetation treatment in the secondary shade zone (from the primary shade zone to approximately one tree height from the stream) would not result in canopy reduction of more than 50 percent. Understory establishment and growth would contribute to canopy cover as well.

Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands/ maintain restore habitat to support well-distributed populations of native species
Project 2 would help speed succession to a stand containing a greater proportion of conifer, similar to what probably existed previously in those areas.

Risk assessment
There would be a short-term (one to three years) elevated risk of a bark beetle infestation from the increased fresh down wood, resulting from both the logging operation and (10 years or more later) creation of additional snags and down wood. Any tree mortality resulting from bark beetles is very unlikely to reduce tree stocking below desired levels.

The incidence of root disease and heartrot would be unaffected or reduced as a result of treatment. Indian paint fungus and red ring rot would be unaffected and would remain at a low incidence. Laminated root rot would be reduced by removing susceptible trees from around current infection centers, halting the spread of disease. In areas of large snags valuable for wildlife (Unit 19D), the buffer would be further from the infection center to protect snags, and additional green trees could die before the thinned buffer is reached.

The potential for windthrow from winter storms would be higher for the first decade following conifer release.

Skyline and ground-based yarding systems would result in bole and crown damage to a small percentage 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. Restrictions to yarding during the sap-flow period in the spring would reduce damage.

Table 13. Average pre-treatment and post-treatment stand characteristics immediately after conifer release.

Unit / Treatment	Age[1] (yrs)	Pre-treatment					Immediately After Treatment				
		TPA[2]	% DF	BA[3] (sq ft)	QMD (in)[4]	RDI[5]	TPA[2]	% DF	BA[3] (sq ft)	QMD (in)[4]	RDI[5]
7A-7D	36	325	13%	226	11.3	0.47	162	21%	120	11.3	0.35
19D	45	305	15%	215	11.4	0.48	174	23%	105	11.4	0.35
26A	46	329	11%	249	11.8	0.50	174	21%	140	11.8	0.35
Project 2 Avg.	**42**	**320**	**13%**	**230**	**11.5**	**0.49**	**170**	**22%**	**122**	**11.5**	**0.35**

[1]Total stand age in 2008 project 2.
[2]Number of trees per acre. [3]Basal area per acre.
[4] Diameter at breast height (4.5 feet) of tree of average basal area (quadratic mean diameter).

Mid-Seral Enhancement (Project 1) and Conifer Release (Project 2)

Bureau Special Status Botanical and Fungal Species
These projects would not affect any other Bureau SS vascular plant, lichen, bryophyte or fungi species since there are no known sites within the project areas or adjacent to the projects. However, thinning dense stands would provide older forest characteristics to the reserved trees at an earlier age when compared to the no action alternative. This action would create habitat for late forest and/or SS species by increasing the secondary growth of the reserved conifers. In addition, it would provide for a higher diversity to the shrub and forb layers by allowing an increase in sunlight to the forest floor.
These projects could affect any species that are not practical to survey for and known sites were not located during field surveys. These species mainly include SS hypogeous fungi species. However, the majority of these species have no known sites within the Marys Peak Resource Area or the northern Oregon Coast Range Mountains.

Invasive (Noxious Weeds, Invasive Non-native Species):
Exposed mineral soil often creates environments favorable for the establishment of noxious listed plant species. All road construction areas, road maintenance areas, ground based logging areas and cable yarding corridors pose the greatest risk of exposing mineral soil with the implementation of these projects. Many common and widespread non-native plant species such as foxglove (*Digitalis purpurea*), burn weed (*Erechtites minima*) and noxious listed species such as Canadian and bull thistles are anticipated to become established throughout the project areas post treatment. These populations generally persist until the native vegetation out competes them in approximately 5 to 10 years or until the conifers reach the sapling stage.

All of the known noxious weed species that occur near the project areas are classified by the Oregon Department of Agriculture as "B" designated weeds. "B" designated weeds are weeds of economic importance which are regionally abundant, but which may have limited distribution in some counties. Where implementation of a fully integrated statewide management plan is not feasible, biological control shall be the main control approach.

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

1) the implementation of the Marys Peak integrated non-native plant management plan allows for early detection of non-native plant species which allows for rapid control,
2) the known noxious weeds species which occur in the project area are regionally abundant throughout the Oregon Coast Range Physiographic Province, and control measures generally consist of biological control,
3) generally these species often persist for several years after timber harvest but soon decline as native vegetation increases within the project areas, and
4) there are no other Oregon listed noxious weed species that are anticipated to become established with the implementation of this project and design features. In addition, all road construction and road maintenance areas would be monitored for Scot's broom infestations and eradicated. Monitoring newly constructed roads would provide for early detection and allow for a rapid response to remove any non-native species of concern. Other species would be eradicated as funding allows.

3.1.2 **Wildlife**

(IDT Reports incorporated by reference: Biological Evaluation for Terrestrial Wildlife (pp. 1 to 11):

Affected Environment

Mid-Seral Enhancement (Project 1) and Conifer Release (Project 2)

Landscape Level Conditions

Both proposed projects occur on BLM managed lands in the Upper and Lower Alsea River 5th Field Watersheds. A broad-scale analysis of federal lands within this part of the Oregon Coast Range was presented within the *Late Successional Reserve Assessment, Oregon Coast Province - Southern Portion (RO267, RO268),* [USDA-FS and USDI-BLM 1997, referred to as *LSRA*]. The *LSRA* recognizes that different portions of these watersheds provide different landscape functions (Core, Corridor, or Buffer) as they form linkages between adjacent blocks of federally managed lands. Most of the federally managed lands (Forest Service and BLM managed lands) are allocated as Late-Successional Reserve (LSR) and are designated to benefit numerous wildlife species that are associated with older forest habitat conditions.

Over the past 150 years (since settlement), extensive timber harvest and several forest fires have resulted in the loss and fragmentation of late-successional forest conditions within these watersheds. Currently, about 36 percent of the federal lands within the Upper Alsea River watershed and 46 percent of federal lands within the Lower Alsea River Watershed exhibit older forest habitat conditions (stand-age greater than 80 years old). However, less than 5 percent of these stands are classified as old-growth forests (stand-age greater than 200 years old). Early and mid-seral forest stands comprise

about 56 percent and 40 percent of the federal lands within the Upper and Lower Alsea River Watersheds, respectively. Late-successional forest are almost absent for private forest lands within these watersheds. Private forest lands in this part of the Oregon Coast Range are dominated by early-seral and mid-seral forest stands that are currently being managed on short rotations (40 to 50 years).

Stand Level Conditions
Approximately 1,186 acres of forest stands were evaluated for Project 1 density management treatments, resulting in 768 acres of proposed treatment units. About 410 acres of mid-seral forests were dropped from treatment consideration due to logging feasibility, adequate or poor stocking, stream protection zones, or other operational and resource concerns. All of the forest stands evaluated in Project 1 are composed of mid-seral conifer-dominated stands with high tree density, moderate to high canopy closure, and are intermingled with hardwoods and some shrub patches.

The Project 2 units are composed primarily of hardwood stands having intermingled mid-seral conifers. About eight acres of Project 2 stands were dropped from consideration leaving about 42 acres of proposed treatment.

The Project 2 units are composed primarily of hardwood stands having intermingled mid-seral conifers. Project 2 units also show low to moderate levels of CWD. There are no live old-growth legacies within Project 2 units.

Special Habitats and Special Habitat Components
Within forested ecosystems, dead wood (snags and down logs), often referred to as coarse woody debris (CWD), is a special habitat component that has been shown to strongly influence the diversity and abundance of wildlife species. Rose et al. (2001) identify 93 vertebrate wildlife species in Oregon and Washington that use snags (for nesting, foraging, roosting, courtship, drumming, hibernating), and 86 species that use down logs (for nesting, foraging, denning, hibernation, hiding cover, thermal cover, travel corridor, lookout). Most of the 93 species associated with snags use trees that are greater than 15 inches in diameter, while about one third of these species prefer snags greater than 30 inches in diameter. The larger diameter hard snags and hard down logs (Decay Class 1 and 2) will, over time, provide for more wildlife species than smaller and softer snags and down logs

Mid-seral forests in this region exhibit a wide range in the density of snags and down logs that are present (*LSRA*, Mellen et al. 2006, Rose et al. 2001). The legacy of past harvests and fire history in these watersheds has resulted in low to moderate accumulations of down logs in advanced stages of decay within most of the Project 1 units (see Table 9). Only the North Fork Overlook units have moderate to high levels of down logs. Stem exclusion processes and small wind-throw events have recently contributed moderate levels of small diameter snags and down logs in many of the Project 1 units.

Buck Roberts Unit 11A has a small non-forested wet area (less than 1 acre) that has been protected from the surrounding treatment unit, and Bummer Ridge Unit 31A has a small meadow (less than 4 acres) with a wet seep that lies adjacent to the unit. There are no other special habitat features associated with treatment units in Projects 1 and 2.

Mid-seral forests in this region exhibit a wide range in the density of snags and down logs that are present (*LSRA*, Mellen-McLean et al. 2009, Rose et al. 2001). The legacy of past harvests and fire history in these watersheds has resulted in low to moderate accumulations of down logs in advanced

stages of decay within most of the Project 1 units (see Silviculture Prescription in Analysis File). Only the North Fork Overlook units have moderate to high levels of down logs. Suppression mortality processes and small wind-throw events have recently contributed moderate levels of small diameter snags and down logs in many of the Project 1 units.

Overall snag density is highest (43 snags/acre) in the North Fork Overlook units and very low in the Buck Roberts and Bummer Ridge Units (4.9 and 1.5 snags/acre, respectively). The majority of the snag component is composed of small diameter trees (less than 15 inches dbh) that have died due to suppression mortality. Larger size snags (greater than 24 inches dbh) that benefit a greater number of wildlife species are scarce on all Project 1 units, except North Fork Overlook which has a scattered component of large snags in most of the units. Project 2 units are hardwood dominated stands that show low to moderate levels of CWD.

The presence of live legacy trees within mid-seral forest can also boost the diversity and abundance of wildlife species (Masurek and Zielinski 2004). North Fork Overlook is the only project area that has a prominent component of live old-growth legacy trees scattered throughout most of the units. There are no live old-growth legacies within Project 2 units.

Special Status Species

Special Status Species that may occur within this project vicinity and which may be affected by the proposed action include the northern spotted owl, marbled murrelet and red tree vole. The red tree vole has recently returned as a Survey and Manage species as a result of a December 17, 2009 court remedy that identified NEPA violations with the 2007 Survey and Manage ROD (USDA-FS and USDI-BLM 2007) and reverted to the 2001 Survey and Manage ROD (USDA-FS and USDI-BLM 2001). A review of an interagency database (GeoBOB) and the Oregon Natural Heritage Database found no records of any other Special Status Species or Survey and Manage Species locations within or adjacent to the planned treatment units.

Northern Spotted Owl

The BLM and cooperators have conducted extensive spotted owl surveys in these watersheds since the mid 1980s. The planned treatment units for Project 1 and 2 currently provide dispersal habitat for spotted owls, but these units generally lack the older forest structure that would provide suitable nesting, roosting, and foraging habitat for this species.

Two active spotted owl sites lie adjacent to Project 1 thinning units. The Buck Roberts project area has about 114 acres of thinning in dispersal habitat within 1.5 miles of the Peak Creek owl site. But no units are closer than 0.5 miles from this owl site. The Bummer Ridge project area has 185 acres of thinning in dispersal habitat within 1.5 miles of the South Fork Alsea owl site. About 65 acres of thinning would occur within 0.5 miles of the site center, including 18 acres of Unit 30A that lies between 170 to 300 meters of the known nest tree.

Current habitat conditions within the expected median provincial home range (1.5 miles) of these two owl sites are provided in Table 14. Portions of Bummer Ridge (140 acres) and all of North Fork Overlook (329 acres) would occur in dispersal habitat of designated Oregon Management Owl Conservation Areas (OMOCA) units OMOCA-36 and OMOCA-39, respectively. Dispersal habitat is considered a constituent element of spotted owl critical habitat.

One of the Project 2 units (Unit 19D) lies within 0.9 miles of the South Fork Alsea owl site. None of the Project 2 units are within owl critical habitat units.

Table 14. Habitat conditions at spotted owl sites affected by the proposed action.

	Habitat in 0.5 miles [1]			Habitat in 0.5 - 1.5 miles [2]					
Owl Site Name	NRF	Disp	NonH	NRF	Disp	NonH	Total	%NRF [3]	Note
SF Alsea – 0217B	363	104	35	1794	1240	987	4523	47.7	Active 07,08
Peak Creek – 1963A	210	130	162	819	1092	2110	4523	22.8	Vacant 2008

Owl habitat in 0.5 miles of the owl site center on all ownerships totals about 502 acres; classified into NRF= suitable nesting, roosting, and foraging habitat, Disp= dispersal habitat, and NonH= non habitat.
Owl habitat in 0.5 to 1.5 miles of the owl site on all ownerships totals about 4021 acres and classified as described above.
Percent Nesting, Roosting, and Foraging habitat within 1.5mile radius of the owl site center on all lands.

Marbled Murrelet

Project 1 and 2 treatment units lie within mid-seral conifer or hardwood forest stands that generally lack the older forest structure (large trees, large mossy branches, well-developed canopy cover) that provides suitable habitat for marbled murrelets (McShane et al. 2004). Some treatment units in Buck Roberts, Bummer Ridge, and North Fork Overlook lie adjacent to patches of suitable murrelet habitat, and two units at North Fork Overlook (Unit 17A and 17B) include several scattered old-growth legacy trees that may provide suitable nesting structure for murrelets.

Five years of marbled murrelet surveys (Evans-Mack et al. 2003) have been conducted at North Fork Overlook. Following surveys in 2002 and 2003, an occupied murrelet site was established after murrelets were detected circling over the old-growth forest patch adjacent to unit 17A. Surveys in 2006, 2008, and 2009 focused on the scattered legacy trees in unit 17A but failed to detect any murrelets in this unit or at the occupied site. Surveys in 1996 established an occupied murrelet site adjacent to unit 19B of Bummer Ridge.

Project 1 treatment units lie between 25 and 31 miles inland from the coast, while Project 2 units lie about 18 to 25 miles inland. All Project 1 and 2 units lie within designated critical habitat units for the murrelet (CHU: OR-04-j and OR-04-k), although none of the treatment units contain suitable habitat that is the primary constituent element of critical habitat.

Red Tree Vole

The red tree vole is a Bureau Sensitive Species (BSS) and currently a Survey and Manage Species (USDA-FS and USDI-BLM 2001). The BSS status only applies to the red tree vole populations in the northern Oregon coast range, north of Highway 20 (Corvallis to Newport). Populations south of Highway 20 including those within the Upper and Lower Alsea River watersheds are believed to be more abundant and well distributed (USDA-FS and USDI-BLM 2007).

As a result of a December 2009 court proceeding, the red tree vole has been returned to a Survey and Manage species in both project areas. However, surveys for this species are not required within the proposed project areas since the habitat conditions within the mid-seral forest stands did not trigger the need for surveys. Voles prefer to nest in older forest habitats in this landscape, but are occasionally found occupying mid-seral forest stands similar to those included in Project 1.

Birds of Conservation Concern
All of western Oregon, including Project 1 and 2 areas, lie within the Northern Pacific Forests Bird Conservation Region. Within this region there are several migratory land birds which are considered Bird of Conservation Concern (BCC) because they appear to be exhibiting downward population trends for several years (Altman 2008; Rich et al. 2004, USDI-FWS 2008c). Thirty-three of the 88 landbird species that regularly occur in the Marys Peak Resource Area are considered BCC species (See Table 15). Eighteen BCC species have a high likelihood of occurring within Project 1 or 2 areas. Incidental observations obtained during wildlife related field work have confirmed the presence of 12 of these species during the breeding season.

Table 15 Bird Species Groups Likelihood of Occurrence within the Project Areas.

Bird Species Grouping	Within MPRA	Likelihood of occurrence in Project Areas [1]			
		High	Moderate	Low	Not Present
Bird of Conservation Concern	33	18	9	5	1
Other Regularly Occurring Landbirds	55	27	12	12	4
Total bird species	88	45	21	17	5

[1] The likelihood that bird species occur in one or more of the project areas based on recent literature review (see Analysis File: Wildlife Report, Appendix B).

Environmental Effects

3.1.2.1 *Alternative 1 (No Action)*

This alternative would not conduct any thinning harvest in Project 1 or conifer release in Project 2 units. There would be no immediate change to the mid-seral conifer forests or hardwood stand conditions within BLM managed lands in these watersheds. Stand development processes would continue unaltered within the forest stands of these project areas.

The No-Action alternative would offer avoidance of any short-term disruption to habitats and wildlife use, but would forego the desirable benefits of mid-seral forest enhancement and conifer release. The current pattern of habitat use by wildlife species within these project areas would be expected to continue unchanged. Dispersal habitat conditions for spotted owls would remain unchanged.

3.1.2.2 *Alternative 2 (Proposed Action)*

Mid-Seral Enhancement (Project 1) and Conifer Release (Project 2)

Landscape Level Conditions
The planned thinning treatments and hardwood release (Projects 1 and 2) would maintain the functionality of the mid-seral forests within this landscape. There are about 18,200 acres of mid-seral conifer forests on BLM-managed lands within the Upper Alsea River Watershed, and 2,230 acres of BLM-managed lands in the Lower Alsea River Watershed. Collectively the proposed Project-1 action would affect about 3.8% of these BLM-managed mid-seral forest stands, with no discernable loss of function or connectivity between these forest habitats. There are about 2,900 acres of hardwood-dominated stands on BLM-administered lands within the Upper Alsea Watershed, and 890 acres of BLM-administered hardwood stands in the Lower Alsea Watershed. Collectively the proposed action

would affect about 1.0% of these BLM-managed hardwood forest stands with no discernable loss of function or connectivity between this forest type.

Stand Level Conditions

The proposed mid-seral forest enhancement (Project 1) of about 768 acres would change the existing forest structure and alter the development of future forest stand conditions in the proposed project areas. The anticipated changes to stand structure are described in the silvicultural prescriptions in the Analysis File. Wildlife species are most likely to be affected by the following direct and indirect changes to forest habitat conditions:

Short-term (less than 10 years)

- light to moderate reduction of canopy closure (resulting canopy greater than 40 percent) over entire treatment area;
- increased horizontal spatial variability within treated stands (gaps and clumps);
- minor reduction and disturbance to existing CWD material (snags and down logs) resulting from felling, yarding, and road construction;
- reduced recruitment rate of small sized CWD would be partially offset by immediate creation of larger CWD of desirable size, and augmentation of decadence processes;
- retention of hardwood tree and shrub diversity.

Long-term (greater than 10 years)

- a significant recovery of overstory canopy closure within treated stands;
- the gradual transition in structural characteristics of the treated stands to more closely resemble late-seral forest (larger diameter trees and limbs, sub-canopy development, greater tree species diversity, greater volume and size of hard CWD, canopy gaps);
- extended persistence of hardwood tree and shrub cover diversity;

Project 1 treatment units would result in altered forest stand conditions, such that expected use by some wildlife species may decline while others would stay the same or increase (Hagar and Friesen 2009). The reduced canopy closure, minor loss of small snags, increased growth of shrubs, and abundance of created slash would likely disrupt the current pattern of wildlife use for the short term.

The analyzed but untreated mid-seral stands (410 acres) lying between and adjacent to the treatment units (768 acres) would function as skip patches that would likely mitigate any short-term disruption or decline of wildlife species that prefer dense mid-seral forest conditions. The Project 1 treatment units would continue to function as mid-seral conifer-dominated habitats for most of the wildlife species which currently use these stands, and many wildlife species, especially those associated with late-seral forest structure and coarse woody debris would benefit from the proposed treatment. Numerous wildlife species would also benefit from the augmentation of CWD which would provide larger pieces (greater than15 inches dbh) of hard material sooner than if left untreated.

Within conifer-dominated ecosystems of the Pacific Northwest, non-coniferous vegetation such as hardwoods and deciduous shrubs often provide the foundation for food webs that contribute to diversity at multiple trophic levels, which benefits many vertebrate wildlife species (Hagar 2007b). The proposed treatment in Project 2 units would alter the canopy closure of the affected hardwood stands to promote the release of existing conifer trees. The post-treatment Project 2 units would still function as hardwood-dominated stands in both the short term and long term, retaining their prominent

component of hardwood trees and understory shrubs even as released conifers attain larger size with fuller crowns. The resulting development of larger conifers with fuller crowns would be beneficial to late-successional forest associated wildlife species without causing any measurable detrimental effect to hardwood associated wildlife species.

Special Habitats and Special Habitat Components
No special habitats would be affected by Project 1 or Project 2. The non-forested wet area within Buck Roberts Unit 11A, and the small meadow adjacent to Bummer Ridge Unit 31A would be protected by buffers that should maintain their existing habitat value.

The special habitat component of CWD would increase in quality as a result of proposed Project 1 treatment. As described above (Stand Level Conditions), the loss of small snag component would largely be offset by the immediate creation of larger (greater than 15 inches) snags and down logs that have greater wildlife value. Additionally, research by Lutz and Halpern 2006 has found that mechanical damage such as windthrow can contribute as much as four times more biomass than suppression mortality in early and mid-seral forest stands. At the landscape scale, the loss of suppression mortality CWD component would be negligible because:

- the proposed units are relatively small in size and widely scattered;
- these units lie adjacent and between skipped patches (similar untreated stands);
- there is an abundance of mid-seral forests forests on all ownerships in these watersheds;
- and, there are over 21,000 acres of late-seral forests in LSR allocation (both watersheds) where CWD conditions are stable and increasing.

Special Status and Special Attention Wildlife Species

Northern Spotted Owl
Portions of Project 1 and 2 treatment units may affect spotted owls as outlined in Table 16. Most Project 1 and 2 treatment units lie well beyond the disturbance threshold (0.25 mile) for spotted owls. With the inclusion of a seasonal restriction for Bummer Ridge Unit 30A, there would be no noise disturbance to active spotted owl sites during the critical breeding season (March 1 to July 7). No existing suitable spotted owl habitat would be affected by the proposed action. Spotted owls may infrequently forage and pass through some of the dispersal habitat that would be altered by Project 1 and 2 treatment units. About 18 acres of Bummer Ridge Unit 30A may get occasional use by spotted owls due to its close proximity to the South Fork Alsea active nest site (within 300 meters). However, none of the observed owl locations at this site over the past 12 years of monitoring were within any of the Bummer Ridge treatment units.

Also, none of the owl locations at the Peak Creek owl site over the past 9 years of monitoring were within any of the Buck Roberts treatment units. These mid-seral treatment units in Project 1 and 2 are unlikely to provide more than connectivity to support adjacent active owl sites. Post treatment stand structure and canopy closure (greater than 40 percent) is expected to maintain the dispersal habitat function of all units. A small percentage of two critical habitat units would be affected by treatment of Project 1 units, but since these treatments would be expected to accelerate the development of nesting structure and improve the structural diversity over the long term, they are unlikely to alter the current conservation value of the CHUs. Overall, Project 1 and 2 treatments are likely to improve habitat conditions for spotted owls and their critical habitat over the long term (greater than 10 years).

Table 16. Summary of Effects to Federally Listed Wildlife Species and Critical Habitat.

Affected Component	Determination [1]	Notes
Northern Spotted Owl		
Noise Disturbance	NLAA	About 38 acres of Bummer Ridge 30A lies within 0.25 miles of active owl site and would have a seasonal restriction from March-1 to July-7.
Habitat Modification	NLAA	Portions of Buck Roberts (114 acres), Bummer Ridge (219 acres), and 11 acres of Project 2 lie within 1.5 miles of active owl sites.
	LAA	About 18 acres of Bummer Ridge 30A lies within 300 meters of owl site.
Critical Habitat	NLAA	All of North Fork Overlook (329 acres) and a portion of Bummer Ridge (140 acres) fall within designated critical habitat units.
Future Habitat Conditions	Beneficial	Treatments are likely to accelerate the development of late-seral forest structure over the long-term (>10 years), which would promote better nesting habitat structure and improve habitat for primary prey species.
Marbled Murrelet		
Noise Disturbance	No Effect	Full seasonal restriction for helicopter use at North Fork Overlook, most other units beyond 0.25 miles of unsurveyed suitable habitat.
	NLAA	Portions of Projects 1 and 2 units totaling 70 acres lie within 100 meters of unsurveyed murrelet habitat that has no seasonal restriction.
Habitat Modification	No Effect	No suitable nesting structure would be altered by Projects 1 or 2.
Critical Habitat	NLAA	Portions of North Fork Overlook (315 acres), Buck Roberts (152 acres), and Bummer Ridge (205 acres) lie within 0.5 miles of suitable nesting habitat and have a canopy height of at least ½ site potential tree height.
Future Habitat Conditions	Beneficial	Treatments are likely to accelerate the development of late-seral forest structure over the long-term (>10 years), which would promote development of potential nesting structure sooner than if left untreated.

Affect determinations for purposes of Endangered Species Act consultation include: LAA= likely adverse affect, NLAA= not likely adverse affect, and No Effect.

Marbled Murrelet

None of the Projects 1 and 2 units would affect marbled existing murrelet suitable habitat. But portions of Projects 1 and 2 treatment units may result in noise disturbance to murrelets or may alter critical habitat that has been designated for this species (see Table 16). Only a small portion of Projects 1 and 2 units (70 acres total) lie close enough to unsurveyed suitable habitat where noise disturbance has the potential to disrupt murrelet nesting behavior if they are present. Also, a small percentage of two critical habitat units would be affected by treatment of Project 1 units, but since these treatments would be expected to accelerate the development of nesting structure and improve the structural diversity over the long term, they are likely to benefit marbled murrelets without diminishing the current conservation value of these CHUs

Red Tree Vole

Only the Project 1 units would occur in forest stands that may have some active red tree vole nests. However, this proposed action is not anticipated to have an appreciable affect on the population of red tree voles in this watershed since voles are well distributed throughout the watershed and since this action would not remove any older forest structure which provides the best habitat for supporting vole population persistence.

Bird of Conservation Concern

In the central Oregon Coast Range the majority of birds complete their breeding cycle within the April 15 to July 15 time period, while some birds (eagles, owls, hawks, woodpeckers) begin breeding as early as February or March and others (flycatchers, finches) may not finish breeding until August. Due to the ubiquitous nature of breeding birds within their suitable habitat, it is reasonable to expect that soil disturbance (affecting ground-nesting birds) and vegetation manipulation would have a direct negative impact on bird nesting success since it would occur during the breeding season. Felling and yarding trees during the breeding season in the Projects 1 and 2 treatment units would likely destroy some nests and disrupt normal breeding behavior of any BCC species that nest or forage in these units. Following thinning harvest and conifer release operations, the resulting habitat conditions would be unfavorable to some bird species, while still providing similar habitat conditions for most of the species that might currently nest in those stands. At the watershed scale, this proposed action is expected to have no discernable negative effects on populations of BCC species since the proposed units would largely retain their habitat value, and since they are very small, widely scattered, and represent a small fraction of the mid-seral conifer (3.8 percent) and hardwood forests (1.1 percent) available on BLM managed lands within these two watersheds.

3.1.3 Soils

(IDT Reports incorporated by reference: Upper and Lower Alsea River Watershed Report for Hydrology and Soils pp.1 to 18)

Affected Environment

Mid-Seral Enhancement (Project 1) and Conifer Release (Project 2)

The soil types in the project areas range from volcanic to sedimentary parent materials and are generally well drained. They contain varying amounts of sand-loam particles up to cobble sized particles. They are generally located in valley bottoms and floodplain terraces. The project areas are all previously disturbed sites and would remain as disturbed sites when the work is completed. There is one small (50 feet wide) road related fill failure on Road 13-7-10 approximately 1. 5 miles west of State Highway 34 junction. No further slumping is anticipated on this portion of the haul route.

Environmental Effects

3.1.3.1 *Alternative 1 (No Action)*

Mid-Seral Enhancement (Project 1) and Conifer Release (Project 2)

This alternative would result in no change to the affected environment. Short-term impacts to soils would be avoided. Soil erosion and routing through existing road drainage structures would continue at the existing levels.

3.1.3.2 *Alternative 2 (Proposed Action)*

Mid-Seral Enhancement (Project 1) and Conifer Release (Project 2)

Direct and Indirect Effects

Following completion of this proposed action, the majority of understory vegetation and root systems would remain, along with surface soil litter and slash from harvested trees. Expected amounts of surface soil displacement, surface erosion, and dry ravel resulting from harvest operations would be minimal (less than 4 percent of the area) in the skyline yarding areas. Some additional soil displacement and compaction can be expected in the ground-based yarding area, (up to 10 percent of the project area) but overall the aerial extent and degree would remain well below the established district guidelines (10 percent or less).

Compaction and disturbance/displacement of soil:

Additional soil compaction can be expected to result in the harvest units associated with these projects. A study on the effects of compaction on soil bulk densities by Page-Dumroese (1993) found that intensive timber removal activities using ground based equipment resulted in a 25 percent increase in compaction and was considered "heavy or intense" compaction. Moderate levels of timber removal activities using forwarder-type equipment resulted in an 18 percent increase in bulk density and skyline based timber removal activities resulted in an 11 percent increase in bulk density of the yarding corridors. All of the proposed timber removal activities are planned and laid out to remain below the cumulative level of 10 percent aerial extent of soil disturbance from the RMP (Timber harvest BMP's , 2008 FEIS, Appendix I).

Approximately 46.9 acres in landings and 21.7 acres in skid trails would be utilized. Because the existing skid trails would be reused, this would result in a cumulative detrimental disturbance level of 8.3 percent in the sale area units. The aerial extent and degree of disturbance would remain within RMP guidelines of less than10 percent disturbance. (Timber harvest BMP's , 2008 FEIS, Appendix I).

Short portions of the existing haul roads may be widened slightly to accomodate logging equipment and to sort and deck logs until transport. Areas where equipment turns or backs around on multiple times near landings would experience heavy compaction and disturbance to the top soil layer. These areas would not readily support new vegetation or tree growth in the first 10 years after the work was completed.

The estimated reduction in growth rate for trees on moderate to heavy 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 (4 to 8 feet wide) as is the case with skyline yarding trails and small landings. If topsoil loss / displacement / compaction are severe or more broadly based in aerial extent, then the negative effects would be more pronounced (greater than 15 to 30 percent growth reduction) and longer lasting (greater than 10 to 20 years in length). The proposed amount of skyline yarding corridors in the sale units is well below the allowable limit in the RMP of 10 percent (Timber harvest BMP's, 2008 FEIS Appendix I), and soil disturbance levels are expected to remain at an insignificant level.

<u>Skyline yarding:</u>
Skyline yarding trails usually result in light compaction of a narrow strip less than 4 feet in width. This is especially true for this type of project where logs are relatively small and there would be adequate slash on the ground in the corridors to yard over. Measurable long term effects on site productivity from this type of disturbance are minimal to none.

Ground based yarding:
Ground based yarding impacts would vary depending on: whether a harvester/forwarder system or crawler tractors are used, how dry the soils are when heavy equipment operates on them and how deeply covered with slash the soils in the yarding roads are. Impacts also include the additional area used for landings. In ground-based skid trails, expect a moderate amount of top soil displacement approximately 10 feet wide and moderate to heavy soil compaction to occur depending on the amount of use. In harvester/forwarder yarding roads, soil displacement is generally minimal to none and soil compaction is light to moderate.

If yarding is done using crawler tractors for the entire ground based area expect moderate to heavy degree of soil compaction and a moderate amount of top soil displacement to occur in skid trails and at landings. If a harvester/forwarder system is used for the entire ground based area very little or no top soil loss or displacement would occur.

Where practical, portions of these existing trails would be reused for skid trails on these projects.

Landings:
Approximately 290 landings (46 acres) would be needed to harvest the proposed areas. Two hundred forty two landings would be used for cable yarding, (20 would be used for both cable and ground based yarding). Thirty eight landings would be used for ground based yarding. About half of the surface area used for landings would be the existing road surface. One helicopter landing is proposed on BLM managed lands in the North Fork Overlook sale area.

Road Work (road construction, renovation, skid trail construction and blocking):
Approximately 3 miles of new road construction is proposed, on or near ridge top locations. The proposed new construction would occur on moderate to low gradient slopes, with no stream crossings. Approximately 750 feet of new road construction in Project 1 is located within 1 site potential tree of stream channels (see fisheries report).

The risk of impacts to water quality due to road construction would be limited by restricting work to periods of low rainfall and runoff. Construction would employ techniques to reduce concentration of runoff and sediment to a minimum, such as outsloping, and rock placement. These new roads would be decommissioned after their use. The proposed final road system is located in a stable geologic landform and there is little risk of road related landslides from the roads on BLM managed lands in the harvest areas. The placement of new roads on the landscape is an average of more than 200 feet from existing streams and the road locations are on topographic divides where any road generated water or sediment would have no impact on drainages in the project area. New road construction, use, and decommissioning would result in no expected additions of sediment to stream channels in the project area

Also included in the proposal is 30 miles of road improvement/renovation work that includes 54 culvert replacements to meet BMP standards. Approximately 9 new drain dips would also be installed in existing road surfaces to help improve watershed function by reducing the roads influence on hill slope hydrology. Drainage on existing roads would be improved where needed, including adding rock surfacing where needed on all project haul roads. Based on previous project work, the spot road renovation and improvement of existing roads would not change the existing amount of current non-forest land. Some encroaching vegetation along these older roads would be removed for safety

concerns and surface rock would be added where needed. The renovations and improvements would provide better drainage and road surface conditions resulting in less road surface erosion into the surrounding area or streams.

There are limited existing OHV trails in the project area. These trails are not having long-term detrimental impacts to the soils resource. The project proposes to block off skid trails. The placement of large debris in these trails would effectively close off the trails to OHV use. This would result in no change in OHV disturbance in the project area.

Site Productivity

For skyline yarder systems, the suggested design features are proposed: One end log suspension where ever practical, and soil impacts in skid trails are expected to result in light compaction in narrow strips less than 4 feet in width. Because the trees in the project area have ample crowns, there would be adequate slash on the ground to yard over thus lowering the amount of compaction. The effect on overall site productivity from light compaction is expected to be low (less than 10 percent) and result in no measurable reduction in overall yield for the project area because of the design features.

For harvester / forwarder systems, the suggested design features are proposed: soils are fairly dry (less than 25 percent soil moisture), equipment operates on an adequate layer of slash (80 percent soil coverage), and full suspension of logs. Soil impacts in skid trails are expected to result in light to moderate compaction due to slash covering the trails. The trees in the project area have ample crowns, so there would be adequate slash on the ground to protect soils during skidding activities. The harvester/forwarder system is expected to result in light to moderate compaction (10 to 15 percent) with no expected measurable reduction in overall yield for the project area because of the design features.

For tractor skidding plus their landings the suggested design features are proposed: soils are dry (less than 25 percent soil moisture) and equipment operates on harvest activity generated slash. Soil impacts are expected to result in moderate to heavy, fairly continuous compaction within the landing areas and the main 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 acres of landings and skid trails is a 20 percent reduction in yield based on previous timber sale monitoring. The overall sale area productivity effect resulting from the impacted acres is expected to be less than 3 percent detrimentally disturbed area for the timber sale units which is well below the 10 percent level allowed in the RMP (2008, FEIS, Timber harvest BMP's, Appendix I).

In order to avoid damage to existing tree roots, skid roads would not be ripped to mitigate compaction. Mitigation would only be in the form of limiting soil disturbance and compaction by skidding on top of slash as much as possible and doing ground based skidding during periods of low soil moisture (less than 25 percent) with a minimum of skid trails (less than 10 percent of the unit area) (2008, FEIS, Timber harvest BMP's, Appendix I).

No measurable amounts of surface erosion are expected from the forested lands treated under this proposed alternative. With timber hauling restricted to periods when no water is flowing on road surfaces, the amount of sediment produced from roads and entering streams would be negligible to none. There would be no measurable cumulative impact to the soils resource outside the project area. Water-barring, blocking and placing debris on skid roads would promote out-slope drainage and prevent water from accumulating in large quantities, running down the road surface and causing

sediment inputs to streams. After several seasons, the accumulated litter fall on the closed surfaces would further reduce the surface erosion potential.

Soil erosion from fuels and harvest treatments:
The proposal includes slash pile burning in the units. Observations over 3 decades of burning piled slash in this area of the 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.. These 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 and the remaining vegetated buffer would filter out any sediment delivered from upslope areas. With slash and existing undergrowth being left on nearly all of the area, no measurable amounts of surface erosion is expected from the forested lands treated under this proposed action.

Placement of water bars 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 water bars 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 rain fall droplets on the soil surface further reducing the potential erosion of the skid trails. Existing OHV use in the area would be maintained by the skid trail closing work described above.

3.1.3.3 *Alternative 3 (Buck Peak Road Haul Route)*

The use of the alternative haul route for the Buck Roberts project area would require 3.6 miles of road renovation work including one culvert replacement on a perennial stream and limited road drainage work besides the addition of new road surfacing material. Using this haul route would mean not having to renovate 3.3 miles of the proposed haul route with the additional low water crossing work on Peak Creek. This reduction in project related road work would result in similar effects in the Alsea River Watershed for either haul route in respect to potential effects to the soils resource. Drainage improvements from either route would improve water quality over existing conditions.

3.1.4 **Water**

(IDT Reports incorporated by reference: Upper and Lower Alsea Watershed Report for Hydrology and Soils pp.1 to 18)

Affected Environment

Project 1 and Project 2 areas are located at elevations ranging from 900 to 2,200 feet. The majority of the project areas lie below the transient snow zone (TSZ), an elevation zone subject to rain-on-snow (ROS) events that have the potential to increase peak flows during winter or spring storms. This zone varies with temperature during winter storms but, in the Oregon Coast Range of Western Oregon it is assumed to lie between 2,000 to 3,000 feet in elevation.

The TSZ is that area considered to be capable of accumulating snow for periods during the winter but is not cold enough to develop a snow pack that would remain for the entire winter season. Because of this ability to accumulate snow, the area can also release all the water in the snow pack when the area is subsequently hit by a warmer rain event. The resulting stream flows from a rain-on-snow precipitation event can be extreme and very quickly flood the stream channel. Conversely, as a result

of little or no snow pack accumulation and infrequent summer rainfall, stream flow in the summer is typically a fraction (less than 20 percent) of winter levels and many headwater channels retreat to subsurface flow.

For the protection of stream channels and aquatic resources, SPZ's were applied to all stream channels and "high water table areas" (small wet area in Unit 11C) in the project area. Stream buffers extend a minimum of 55 feet from stream channels and to the extent of the riparian vegetation around "wet areas". Sediment supplies are in the range expected for their stream type (Rosgen , 1994). Channel substrates are typically sand, with some pebbles and gravels. Some channel reaches contain large amounts of CWD. The remaining channels all contained sections of discontinuous flow where water went subsurface.

The general project area receives approximately 60 to 70 inches of rain annually and has a mean 2-year precipitation event of 6.0 inches in a 24-hour period.

Mid-Seral Enhancement (Project 1) and Conifer Release (Project 2)

Project area streams

Stream channels in the main project areas are primarily small 1st and 2nd order headwater streams; these are "source" reaches, following the classification of Montgomery and Buffington (1993). On steeper gradient streams (10 to 20 percent), these have developed into confined, step-pool channels typically less than ten feet wide. All of the channels are low in their existing amount of contributed large wood from nearby riparian forests but are well shaded and meet the Oregon Department of Environmental Quality (DEQ) standard of 80 percent shade.

The remaining channels in the project areas are small with intermittent or ephemeral flow. These small tributary channels flow intermittently on the surface before disappearing underground, only to pop out again down-slope. It's likely that ground water and intricate patterns of subsurface flow, as opposed to surface run-off, is the primary system of water delivery to these small channels. Most are lower gradient (less than 10 percent) with small substrates (gravels, sands and silts) reflecting the adjacent soils.

During field review of stream channels in the project area, the perennial channels were observed to be mostly stable (not experiencing channel changes outside the expected range of natural variability) and functional (the size of stream substrate and woody debris amounts are similar to reference streams in the Coast Range province). Sediment supplies are in the range expected for their stream type (Rosgen, 1994).

Project area wetlands

One very small wetland/ wet area was identified within the project areas. This area is located in Unit 11C of the Buck Roberts Sale area. The proposed harvesting around this site would be completed with skyline harvest and no corridors would go through the area. All wetland sites (identified or not) are excluded from treatment in this proposal.

Project area water quality and beneficial uses

Project area stream flow

The project areas are located in numerous 7th field watersheds (Peak Creek, Fall Creek, Record Creek, Bailey Creek, Tobe Creek, and Bummer Creek). All proposed culvert replacements ultimately drain to the Lower Alsea River. Project streams are similar to other Western Oregon streams where highest discharge takes place during winter storm events. Summer base-flow normally begins in perennial channels sometime in July and continues through October. Many small headwater channels (intermittent or ephemeral) dry up completely during this period.

Peak Flow

Peak flow refers to the instantaneous maximum discharge associated with individual storm or snowmelt events (U.S.E.P.A., 1991).

Jones and Grant (1996), among others, hypothesize that forest harvest leads to increases in total storm runoff while road construction and wood removal from channels results in earlier, and higher peak flows. Stream channel patterns and dimensions (i.e. width, depth and gradient) adjust to accommodate storm flows ranging from 1 to 5 year events and therefore, change in the size or timing of peak flows can affect channel scour and fish habitat. The cumulative effect of increases in peak flow can be large, causing flooding, with stream channel and bank damage leading to increased fine sediment transport and higher turbidity. Seventh field and 6th field watersheds are appropriate size watersheds to be able to review impacts of predicted changes in peakflows because the changes can be measured in channel dimensions and patterns as the size of the stream channels are generally less than 20 feet wide and sampling sites are easier to monitor.

Potential for peak flow augmentation due to forest harvest: Current Condition

A rigorous analysis of peak flow potential for both rain-dominated and rain-on-snow dominated 6th field watersheds in the project areas was completed in the *Final Environmental Impact Statement for the Revision of the Management Plans of the Western Oregon Bureau of Land Management* (FEIS 2008). This analysis is located on pages 753-759 of Volume II and also in Appendix I of Volume III of the FEIS. The analysis included the existing condition and proposed timber harvest in a ten year planning period. None of the watersheds included in this proposal (or in the entire Alsea River Watershed) were identified as being susceptible to changes in peakflow properties from the existing harvest conditions.

Existing Peak Flow/Water Quality Effects from Roads

Road surfaces have been implicated as important contributors to increased peak flows. As the slope increases, the extent of surface and subsurface disturbance required to construct a stable road increases. Under the worst case scenario, more than 50 percent of cut banks near stream channels may intercept groundwater and rout it along road ditches (Toman, 2004). In addition, when road ditches drain intercepted water directly to streams, they act as an "extension" of the stream network and can have a measurable effect on stream flow which may include an augmentation of peak flows on a watershed scale.

Streams near to roads are at higher risk for water quality contamination from material washed off the road surface and for increased stream temperature as a result of reductions in streamside shading. During storms, runoff from unpaved forest roads may deliver sediment to streams resulting in increased sediment transport, deposition of fines in gravels and turbidity levels that exceed natural background levels. Road analyses completed for other harvest projects in the Alsea River Watershed in the recent past have shown that the project watersheds display a road extension value of less than ½ the value where road related stream problems begin to appear (Rickard Creek, Yamaha Thin, and Got

Away EAs). This project includes approximately 3 miles of new road construction on ridge tops that would not require any additional culvert installations. Also included in the proposal is 30 miles of road improvement/renovation work that includes 54 culvert replacements to meet BMP standards in the 2008 FEIS. Approximately 9 new drain dips would also be installed in the road surfaces to help improve watershed function by reducing the roads influence on hill slope hydrology.

Oregon Department of Environmental Quality (DEQ) Standards
The Oregon Department of Environmental Quality's (DEQ) 2004/2006 - 303d List of Water Quality Limited Streams (http://waterquality.deq.state.or/wq/303dpage.htm) is a compilation of streams which do not meet the state's water quality standards. The following streams in the project areas are on the list for a variety of reasons ranging from water quality parameters and sedimentation but all are listed for temperature concerns. Bailey Creek: mile 0 to 4.6; Bummer Creek: mile 0 to 8.2; Fall Creek: mile 0 to 9.8; North Fork Alsea River: mile 0 to 15; Peak Creek: mile 0 to 7; South Fork Alsea River: mile 0 to 17.2; and the Lower Alsea River: mile 0 to 47.4. These areas range from as close as 55 feet to more than 10 miles downstream from the proposed activities.

The DEQ also published an assessment, the 319 Report, which identifies streams with potential non-point source water pollution problems (2004 - Oregon Statewide Assessment of Nonpoint Sources of Water Pollution). The Alsea River Watershed is currently undergoing a data collection phase by the DEQ to determine what parameters (if any) and what subwatersheds (if any) should be listed as needing a total maximum daily load (TMDL) completed to correct water quality or habitat related problems. At this point, none of the project streams are listed in the 319 report.

Beneficial Uses
There are no known existing municipal or domestic water users in the specific project areas. There are existing instream water rights in the Bummer Creek watershed, and the North Fork and South Fork Alsea River for anadromous and resident fish rearing approximately 4 stream miles downstream of the project areas. Irrigation and livestock watering occur in the Alsea valley, several miles downstream from the project area. Additional recognized beneficial uses of the stream-flow in the project area include anadromous fish, resident fish, recreation, and esthetic value.

Environmental Effects

3.1.4.1 *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 Watershed Analysis and the Affected Environment section of this report. No reduction of forest canopy would take place. No additional disturbance to flow paths resulting from timber harvest and road work/use would occur. Streams disturbed from past management would continue to display the above referenced stable conditions.

3.1.4.2 *Alternative 2 (Proposed Action):*

Watershed Hydrology: Direct and Indirect Effects

Streamflow:
Project 1 and Project 2 both include timber harvesting activities and have been analyzed together since increases in mean annual water yield following the removal of watershed vegetation have been documented in numerous studies around the world (Bosch et al., 1982). Measurable increases (greater

than 10 percent) in water yield would be expected to last approximately 20 to 30 years based on the above cited studies. Vegetation would intercept and evapotranspire precipitation that would otherwise become runoff. Thus, it can be assumed that the actions considered under this proposal would likely result in some small increase in water yield (including a small increase in summer base flow) which correlates with the removal of a portion of the conifer overstory in the watershed. Based on the amount of harvest in this proposal, the level of water yield increase would be well below 10 percent and would not be able to be detected from the natural range in variability in flow levels on a year to year basis.

Water Quality: Direct and Indirect Effects

Mid-Seral Enhancement (Project 1) and Conifer Release (Project 2)

Temperature and Fine Sediment:

Logging:
For Project 1 harvest areas, appropriate SPZ's have been designed following the 1995 RMP direction and would maintain the riparian characteristics and shade requirements needed to maintain stream temperatures. Project 2 harvest areas include 15 acres of RR LUA that would experience some level of density management (hardwoods removal) to help improve the characteristics of the remaining conifer stand. Project 2 also includes an additional 27 acres of hardwood removal to improve conifer stands that are outside the RR LUA.

No stream temperature data was available for this analysis. The channels are generally shaded by alder, conifer, ferns and brush. Stream shading varies between dense canopy (greater than 80 percent angular canopy density) cover by conifers to open canopy (50 to 60 percent angular canopy density) at flatter reaches (Brazier and Brown 1972). The flatter stream reaches were those that had discontinuous flow where there was no surface flow. Streams in the Bummer Ridge and Buck Roberts project areas are classified by the South Fork Alsea Watershed Analysis as having a "low" risk of detrimental changes in water temperature based on stream bank vegetation shading (Map Plate 9, USDI 1995).

Streams in the North Fork Overlook project area are classified by the North Fork Alsea River Watershed Analysis as having a "low" risk of detrimental changes in water temperature based on stream bank vegetation shading (Map Plate 10, USDI 1996). There is one small section of stream identified near Unit 17B that is classified as having a high risk for changes in stream temperature if stream bank vegetation was removed. This entire stream has a 300 foot buffer (each side) proposed, so no change in stream temperature is expected.

Based on field observations, aerial photo reviews of streams completed for the analysis of this EA between 2004 and 2006, and modeling runs for the project area, current streamside vegetation and valley topography appears adequate to shade surface waters during summer base flow and it is likely that stream temperatures consistently meet the Oregon state standard (18 degrees Celsius) for these waters.

Project 1 acres of density management harvest include 188 acres in the Buck Roberts timber sale, 329 acres in the North Fork Overlook timber sale, and 265 acres in the Bummer Ridge timber sale. Project 1 also includes 3.4 miles of roadside hazard tree removal with impacts generally restricted to the existing road prism. Harvest generated slash would be maintained in the yarding corridors to minimize

the need for machines to travel on bare soil, and ground-based equipment would only be allowed on slopes less than 35 percent.

Tree removal is proposed on some steeper slopes in all project areas except Bummer Ridge. The existing condition of the areas show no sign of mass wasting on BLM lands. Considering the harvest type (cable or aerial), the existing road locations above and below the proposed units, and the small size of the steeper portions of the units, it is not anticipated that the thinning harvest activity would trigger any mass wasting or slumping in the project areas. Therefore, increases in sediment delivery to streams due to mass wasting are unlikely to result from this action.

In the less steep portions of the project areas, the SPZ's in riparian areas have high surface roughness, which would function to trap any overland flow and sediment before it could reach any streams. Ground-based skidding would occur during periods of low soil moisture with little or no rainfall, in order to minimize soil compaction and erosion. Aerial and skyline yarding are not projected to increase sediment production in the project areas.

Existing OHV use in the project area is not having a detrimental impact on water quality through sediment introduction to stream channels. The proposed closing of the project skid trails would result in the maintenance of existing OHV use in the project area.

Project BMP's, as described previously would be implemented to eliminate and/or minimize sediment generation and delivery to stream channels from the proposed project activities. Because there is no measurable increase to streamflow expected from this activity, there is no expected increase in sediment generation or delivery to streams and no expected effect to existing beneficial uses of the project watershed including the existing water rights users.

Fuels Treatments:
The majority of slash associated with this project in the yarding areas would be left on site. Where large amounts of slash are found 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. These 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 and the remaining vegetated buffer would filter out any potential sediment delivered from upslope areas. Based on previous burning projects, it is not expected that any erosion would occur from these areas due to the burning and thus there would be no impact to sediment generation or nutrient levels available to the remaining vegetation, which would maintain the productivity of the stand.

Road Work and Timber Hauling:
Approximately 3 miles of new road construction is proposed, on or near ridge top locations. The proposed new construction would occur on moderate to low gradient slopes, with no stream crossings.

Approximately 750 feet of new road construction in Project 1 is located within 1 site potential tree of stream channels (see fisheries report), there are no new stream crossings proposed. The risk of impacts to water quality due to road construction would be limited by restricting work to periods of low rainfall

and runoff. Construction would employ techniques to reduce concentration of runoff and sediment to a minimum, such as outsloping, and rock placement. These new roads would be decommissioned after their use.

The proposed final road system is located in a stable geologic landform and there is no risk of road related landslides from the roads on BLM managed lands. The placement of new roads on the landscape is an average of more than 200 feet from existing streams and the road locations are on topographic divides where any road generated water or sediment would have no impact on drainages in the project area. New road construction, use, and decommissioning would result in no expected additions of sediment to stream channels in the project area.

The project would also include the construction of a hardened drive-thru ford on Peak Creek. The ford would be placed in the lowest portion of the floodplain. The existing culvert is completely plugged with beaver debris and silt and cannot be unplugged to allow the creek to flow in the historic channel (unless a major flood event removes downstream beaver structures and associated bedload). If the water is pumped around the site or allowed to go through a temporary placed culvert, there would be no increased sedimentation expected in the Peak Creek system from this activity.

Also included in the proposal is 30 miles of road improvement/renovation work that includes 54 culvert replacements to meet BMP standards. Approximately 9 new drain dips would also be installed in existing road surfaces to help improve watershed function by reducing the roads influence on hill slope hydrology. Drainage on existing roads would be improved where needed, including adding rock surfacing where needed on all project haul roads. Drainage improvements would likely improve water quality over existing conditions.

Several culverts have been identified along the proposed haul routes, which have reached the end of their design life. The pipe bottoms are in the advanced stages of decay, with replacement being the necessary action in order to maintain the integrity of the transportation system, as well as to minimize the associated increase in sediment which would be transported into adjacent streams as the failing process accelerates. Likewise, to reduce some of the longer lengths of ditch runs and the accumulated sediment, additional culverts would be installed where benefits would be achieved. Culvert diameters would be increased to meet the needs during storm events, and several downpipes would be installed to minimize embankment scour at the pipe outlet.

Timber hauling during periods when water is flowing on roads and into ditches could potentially increase stream turbidity if flows from ditches were large enough to enter streams. All hauling would be restricted at any time of the year if necessary to avoid excessive increases in erosion and sedimentation. Based on the road locations and the project design features, there is no expected impacts on stream turbidity from the project proposal.

Channel Morphology

Projects 1 and 2 are unlikely to affect stream channel stability and function as all field identified streams and wet areas would be protected with a minimum 55-foot SPZ. These no-treatment zones would maintain the existing geomorphic conditions in the stream corridors including the streambanks and bottoms from project related impacts. No yarding would occur across streams. No bank stabilizing vegetation would be removed. Project 2 (Units 19D and 7D) would be removing large red alder trees that could potentially become LWD in the streams. However, thinning is proposed to

produce larger conifer trees over time that would be available to fall into the streams adding longer lasting structure and complexity to the channels.

3.1.4.1 *Alternative 3 (Buck Peak Road Haul Route)*

The only changes to be analyzed under this alternative include the modification of the proposed haul routes associated with the Buck Roberts project area (Road 14-6-6) and the changes in road renovation on the affected road segment. The haul route would vary from the proposed action alternative to include a route that would exclude the Peak Creek low water ford and provide for year round haul. The proposed alternate haul route is contained within the Upper Alsea River 5th Field Watershed.

Road Number	Work included in Renovation / Improvement	Miles
13-6-29	Road shaping and rock	3.42
14-7-5	Road shaping and rock, one stream culvert replaced	0.18

Hauling

This alternative includes one change in the proposed haul routes compared to the proposed action alternative. Effects to water quality resulting from hauling associated with all other haul routes in the Buck Roberts project area, excluding the Peak Creek Road and Buck Peak Road Route, would be the same.

The majority of the Buck Peak Road haul route (Road 13-6-29) is located near ridge lines and is graveled. Buffer distances of at least 200 feet would be expected to capture the majority of sediment generated from hauling on road surfaces thereby limiting any impact to water quality. Based on the location of majority of the alternate haul route, and the occurrence of only one stream crossing, sediment transport would be unlikely to impact water quality. See the fisheries report for a more detailed description of this alternative haul route.

Wet-season hauling on Road 13-6-29 includes one crossing over a perennial stream. Crossing over this stream may have direct short-term connections of road surface flows with stream channels. Cessation of hauling during heavy rainfall periods, when road surface flows are most likely to be connected to stream channels, would minimize the extent of sediment being disturbed and subsequently available for transport to the stream channel. Minor site specific impacts to short reaches of stream channel downstream of these stream crossings could occur due to sediment generated from hauling. Application of sediment control project design features (silt fences, hay bales etc…) and cessation of haul during heavy rainfall would minimize the magnitude of sediment reaching streams. The duration of sediment reaching the stream would be short-term, occurring during the wet seasons during and immediately following hauling activities.

Road Construction and Renovation

Slight modification of orientation of new road junctions with the Peak Creek Road may occur. Proposed changes would not result in changes to effects analysis as described previously.

Short-term impacts to water quality may occur from minor renovation of the Buck Peak Road to provide wet season haul. The majority of road is not in close proximity to streams and would not impact water quality. All road renovation work would be seasonally restricted to occur during the dry season, typically May thru October. Road renovation treatments (rocking, grading, ditchline

reconstruction, and cross drain replacements) would be expected to result in a minor short-term increase in sediment reaching associated cross drains and the stream crossing in the winter following the work, until reestablishment of vegetation in the subsequent growing seasons.

Utilization of the Buck Peak Road Route would include the replacement of a culvert on a perennial stream on Road 14-7-5. One study of culvert replacement impacts on sediment and turbidity, conducted in Idaho, indicated discernable turbidity was transported no more than ½ mile from the treatment sites (Foltz et al 2008). Based on these results it would be unlikely that site level impacts of culvert replacement on this perennial stream would result in long term impacts to water quality beyond the half mile limit.

3.1.5 **Fisheries/ Aquatic Habitat**

(IDT Reports incorporated by reference: Revised Upper and Lower Alsea River Watershed Restoration Fisheries Report - pp. 1 to 4)

Affected Environment

Mid-Seral Enhancement (Project 1) and Conifer Release (Project 2)

Upper Alsea River Watershed

Fish Passage and Access

Major tributaries associated with the project area in the Upper Alsea River include North Fork Alsea River, South Fork Alsea River, Crooked Creek, Tobe Creek, Bummer Creek, Trout Creek, and Peak Creek. Peak Creek Falls, near river mile 0.5, limits access to most of Peak Creek. A perched culvert near river mile 1 limits access to most of Trout Creek. The reaches upstream of these barriers are known to contain resident fish. No other barriers to migration were noted in proximity to the project area.

Aquatic Habitat

Oregon Department of Fish and Wildlife (ODFW) habitat surveys have been conducted on many of the affected streams downstream from the treatment units. In general, habitat conditions are mixed in the project area streams with a tendency for sediment, wood, and width/depth ratio being in less than desirable conditions. Pool area was generally desirable in Peak Creek, Bummer Creek, and Record Creek otherwise the quantity of pool area was considered low. Shade was at desirable levels for all streams except the lowest reach surveyed in North Fork Alsea River and Peak Creek. Sediment conditions were below desirable levels for all but one reach surveyed in Bummer Creek. Key wood was lacking in all but one reach in Peak Creek and one reach in Record Creek. Width to depth ratio was less than desirable, except in Record Creek. Several habitat restoration projects have been conducted on BLM managed lands in Tobe Creek since the mid-1980s, primarily to enhance large wood debris conditions.

Fish Distribution

Coastal cutthroat trout are present in South Fork Alsea River, North Fork Alsea River, Crooked Creek, Bailey Creek, Baker Creek, Bummer Creek, Tobe Creek, Trout Creek, and Peak Creek. Western brook lamprey and sculpin would also be considered present within these streams. However, the precise upper limit of resident fish distribution is unknown for most of the remaining affected streams associated with the project area. Distribution of resident fish species was estimated based on

accessibility to suitable habitat determined by stream slopes, sufficient drainage area to create minimal suitable habitat, and known long standing barriers.

Chinook salmon, coho salmon, and steelhead are present in the North Fork Alsea River, South Fork Alsea River, Crooked Creek, Tobe Creek, Bummer Creek, Trout Creek, and Peak Creek (see Map 4). Coho salmon and steelhead are located in Baker Creek and Banton Creek. Pacific lamprey distribution is likely contiguous with steelhead distribution in all of these streams.

Lower Alsea River Watershed

Fish Passage and Access

Within the Lower Alsea River system Fall Creek is the primary tributary. Historically access to Fall Creek was limited by Fall Creek Falls, approximately 7 miles downstream from the project area. The Oregon Hatchery Research Center maintains a water intake and dam on Fall Creek approximately 5½ miles downstream from the project area. The dam has a fish ladder designed to pass juvenile and adult salmonids and is not believed to be a barrier to migration.

Aquatic Habitat

Oregon Department of Fish and Wildife habitat surveys have been conducted on Fall Creek adjacent to and downstream of the proposed treatment units. In general, habitat conditions are moderate in Fall Creek with a tendency for sediment, wood, and width/depth ratio being less than desirable. Pool area was at or near desirable levels. Shade was at desirable levels for all reaches except the lower reach. Sediment conditions were below desirable levels for all reaches. Key wood was lacking in all reaches. Width to depth ratio was less than desirable in all reaches.

Fish Distribution

Winter steelhead and lamprey (the only native anadromous species present) were historically above Fall Creek Falls. A fish ladder was constructed in the late 1940s to pass adult salmon over the falls. Currently coho salmon, steelhead, cutthroat trout, Pacific lamprey, western brook lamprey, and sculpin are present in Fall Creek adjacent to the western parts of the project area (see Map 4). Chinook salmon are located approximately 3 miles downstream from the project area.

Marys River Watershed

Fish Passage and Access

The primary drainage affected by the project is Miller Creek and tributaries, all of which are tributary to Oliver Creek. Hull Oaks Lumber Company maintains a small dam to create a log pond on or adjacent to Miller Creek in Section 16. Fish passage facilities were provided; however, the effectiveness of these facilities is unknown. No other historical barriers to fish passage are known to exist on Miller Creek or Oliver Creek. No anadromous salmonids are thought to enter Oliver Creek or its tributaries (BLM 1997). Oliver Creek is tributary to Muddy Creek in the Marys River Watershed.

Aquatic Habitat

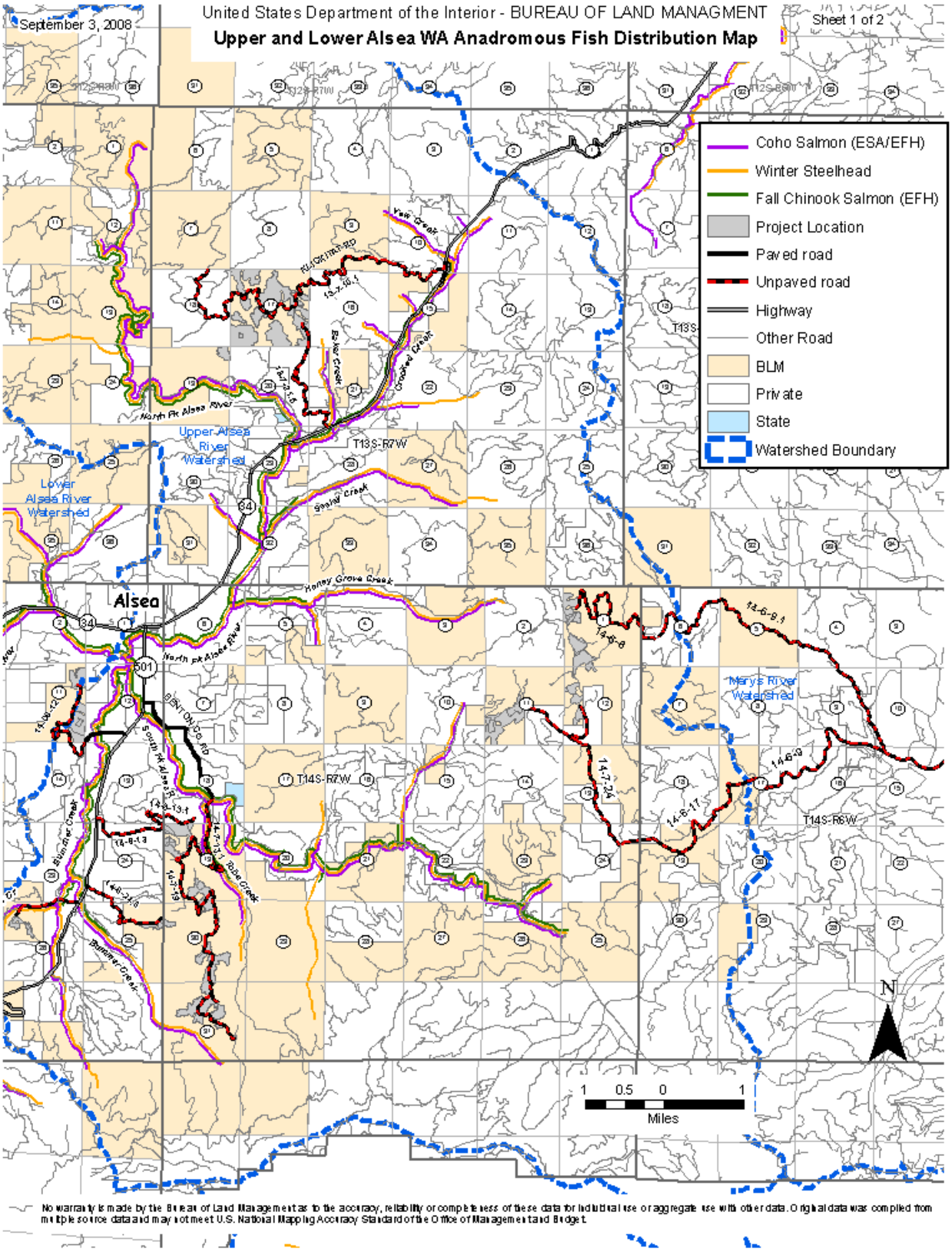
No aquatic habitat surveys have been conducted in Miller Creek or downstream from the project area. Oregon Department of Fish and Wildlife protocol surveys of Oliver Creek are located upstream of the Miller Creek junction, thus would not receive transported material from Miller Creek and would not to be relevant to the action area. No habitat surveys are known to exist for the streams in the project area.

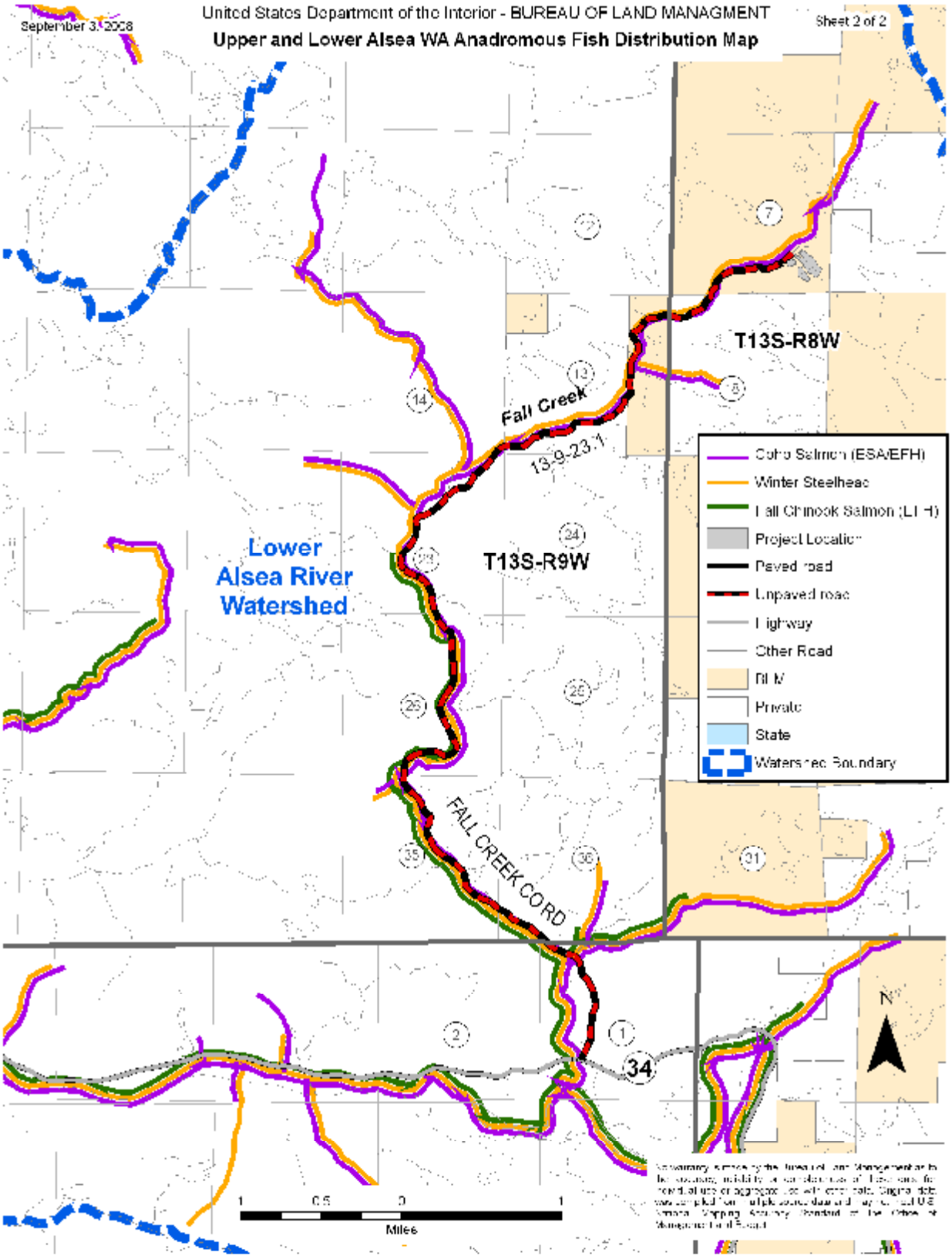
Fish Distribution
Cutthroat trout and sculpin are the only field verified species present within the project area. Western brook lamprey and Pacific lamprey are suspected within fish bearing streams associated with the project area. Chinook and coho salmon, and steelhead are located approximately 37 miles downstream from the project area.

Rare, Threatened, and Endangered Species
The Oregon Coastal (OC) coho salmon is listed as threatened under the Endangered Species Act (ESA). Oregon Coast coho salmon are present in all drainages within the Upper and Lower Alsea River Watersheds, except the Upper Peak Creek and East Fork Peak Creek drainages (See Map 4).

Upper Willamette River (UWR) winter steelhead, UWR Spring Chinook salmon, and Oregon chub are listed as threatened or endangered under the ESA, as amended, in the Willamette basin. These species do not occur within any of the drainages associated with the proposed actions. Oregon chub are located in isolated pools in Finley Wildlife Refuge in the Marys River Watershed. Chub habitat is not connected to streams that drain from the project area. No effects to these species would occur and will not be discussed further.

Map 4: Proposed Timber Haul Route and Anadromous Fish Distribution




September 3, 2008
United States Department of the Interior - BUREAU OF LAND MANAGMENT
Upper and Lower Alsea WA Anadromous Fish Distribution Map
Sheet 2 of 2
T13S-R8W
T13S-R9W
Fall Creek
13-9-23.1
Lower
Alsea River
Watershed
FALL CREEK CO RD
Coho Salmon (ESA/EFH)
Winter Steelhead
Fall Chinook Salmon (LFH)
Project Location
Paved road
Unpaved road
Highway
Other Road
BLM
Private
State
Watershed Boundary
N
1 0.5 0 1
Miles

Environmental Effects

Mid-Seral Enhancement (Project 1)

3.1.5.1 ***Alternative 1 (No Action):***

Current timber stand conditions would be maintained. Expected benefits of thinning riparian stands, accelerating the growth rates of retained timber subsequently increasing the average diameters of trees available for future LWD recruitment 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.

Mid-Seral Enhancement (Project 1)

3.1.5.2 ***Alternative 2 (Proposed Action):***

Mid-Seral Enhancement (Project 1)

Yarding/Falling

Flow effects

The proposed project would change forest cover between 0.1 and five percent in any of the affected 7th field drainages and between 0.5 and 1.7 percent of any affected 6th field sub-watershed. The hydrology analysis, based on the 2008 FEIS flow analysis, determined that no impacts to stream flows were anticipated (Wegner 2009). Assuming that no discernable changes in peak and base flows within the treatment area are anticipated, no alternations to fish habitat would be anticipated.

Temperature effects

Protection of stream shade is the critical component in protecting stream temperature regimes (Beschta et al 1989, Belt et al 1992, Moore et al 2005). According to the stream shading sufficiency analysis done for the proposed treatment units, the proposed SPZs of 55 feet was sufficient to protect critical shade in the primary shade zone (Snook 2009). The proposed vegetation treatment in the secondary shade zone (approximately 210 feet from the stream) would not result in canopy reduction of more than 50 percent. Protection of stream shading thru application of SPZs and silviculture prescriptions retaining adequate canopy cover would be expected to maintain the existing stream temperature (Wegner 2009). Based on the shade sufficiency analysis, the hydrology report water quality analysis, and the implementation of the project design features, the proposed actions are unlikely to impact fish habitat both at the treatment site and downstream.

LWD effects

Loss of CWD and large woody debris (LWD) due to harvest can alter the stability and quality of aquatic habitat. Based on the stand analysis, including riparian areas, the proposed action would retain trees which would reach larger diameters earlier compared to the no treatment option, creating natural opportunities for higher quality LWD recruitment in the long-term (Snook 2009). In the short-term, the smaller woody debris would continue to fall from within the untreated SPZs. Wood recruitment studies conducted in the Pacific Northwest have shown the majority of woody debris recruitment occurs within 59 to 65 feet of the stream edge (McDade et al 1990, Van Sickle and Gregory 1990, Meleason et al 2002).

The proposed SPZ width, which accounts for 85 percent of this woody debris recruitment zone, is anticipated to maintain wood recruitment rates. Therefore, the proposed actions are not expected to cause any short term effects to aquatic habitat at the site or downstream.

Proposed thinning in the riparian treatment areas is anticipated to increase the average growth of the remaining trees between 30 to 58 percent over 30 years compared to not treating the stands (Snook 2009). Larger wood would begin to be recruited from farther up the slopes as the treated stands reach greater heights. 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 by SPZ retention zones, the proposed actions are not expected to cause short-term changes to fish habitat at the site or downstream. In the long-term the increase in the size of trees in one site potential portion of RR LUA could benefit LWD recruitment to the stream channels, thus potentially improving the quality/complexity of aquatic habitat adjacent to the treatment areas in the future.

Fish habitat is at least 55 feet downstream from the riparian treatment areas and beneficial effects to fish habitat from wood growth could be realized in the event of mass movement. The BLMs Watershed Analysis (BLM 1995, 1996) completed in the project area assessed mass movement risk in the watershed area. In addition, the BLM Timber Production Capability Classification (TPCC) identified fragile soils where forest productivity may be impaired by soil erosion, mass wasting, reduction in nutrient levels, reduction in moisture supply capacity, and rise of ground water table (BLM 1986). For this analysis all lands identified in TPCC as fragile for gradient, surface erosion, or mass wasting were selected for further review.
Within the *South Fork Alsea River Watershed Analysis* (WA Map 11) all project areas were generally located on slopes considered low-risk for mass movement, except a portion of Unit 30A was identified in TPCC as at-risk for movement. Within the Lower Alsea River Watershed project treatments were generally located on slopes considered low-risk for movement. Treatments proposed on lands considered at low risk for mass movement resulting in subsequent transport of large wood downstream to where fish reside would be considered highly unlikely and effects to fish habitat would be highly unlikely.

Within the North Fork Alsea River much of the project area was located on slopes considered moderate to high-risk for mass movement (WA Appendix 4 Map 16). Timber Productivity Classification Code mapping indicated only a small part of the project area as at risk (approximately 17 acres).

Treatment on part of unit 30A near Tobe Creek in the South Fork Alsea River was considered at risk for erosion or mass movement based on TPCC (approximately 17 acres). McDade et al (1990) and May and Gresswell (2003) indicated that effectively all down wood was recruited within 200 feet of streams. Within 200 feet of streams, two acres of TPCC restricted lands were identified in treatment units in the North Fork Alsea River and six acres of treatment in the South Fork Alsea River. Assuming the at-risk ground within 200 feet of stream channels has the greatest probability of contributing LWD to streams, the proposed action may remove wood from a maximum of eight RR LUA acres in the project area for at-risk mass movement.

At-risk grounds would be treated thru cable or helicopter yarding. The six acres of at-risk treatment area in unit 30A would be cable yarded to existing road or new roads located on ridgetops. Site level compaction of soils and ground disturbance would be minimal on cable ground. The proposed treatments including retention of stream side buffers at least 55 feet, post-treatment Relative Density

(RD) of 31, trees per acre (TPA) retention of 30, one end suspension, and the very small area treated within 100 feet of streams suggest treatment is highly unlikely to increase mass movement risk at the site.

The potential for increasing risk of mass movement in Unit 17B covering 1.5 acres in the North Fork Alsea River drainages would be highly unlikely, as most of the steepest ground is proposed as helicopter yarding, hence no compaction or displacement would be anticipated to alter water concentration. Risk of landslide movement in Unit 17C on 0.5 acres of cable ground is extremely low. The proposed treatments including retention of stream side buffers at least 55 feet, post-treatment RD of 29 to 32, TPA retention of 35 to 37, one end suspension, and the very small pockets of treatment areas within 100 feet of streams suggest treatment is highly unlikely to increase mass movement risk at the site. Project activities in at-risk area of both the North Fork and South Fork Alsea River were considered unlikely to alter mass movement risk at the site, thus impacts to nearby aquatic habitat would be unlikely.

Maintenance of 2,600 feet of road less than 100 feet from LFH may include hazard tree removal. Therefore proposed renovation may affect woody debris recruitment. However, the existing stand adjacent to 14-7-18 and 14-7-19 roads within 200 feet of Tobe Creek is dominated by alder. Only alder trees overhanging the existing roads and considered eminent to fall onto the road (root sprung or creating an overhead hazard) would be treated as hazard trees. The average diameter of the alder stand adjacent to the 14-7-18 and 14-7-19 roads is 11.5 inches, substantially less than large wood criteria (20 to 24 inches in diameter). In general alder is unlikely to reach diameters sufficient to meet LWD standards. Due to the small diameter of the alder stand and as alder would be the only tree species treated for hazard in proximity to fish, no impacts to the LWD indicator would be anticipated where fish reside.

Sediment effects

Skidding can compact soil and displace soil thus allowing sediment to be transported down slope and potentially to the stream channel. Skyline yarding corridors can also displace soil, thus allowing sediment to be transported down slope and potentially to the stream channel, negatively impacting stream channel bedload. Proposed yarding is unlikely to result in any measurable changes in sediment delivery to the surrounding stream network (Wegner 2009). The dominant use of aerial and skyline yarding, buffers, residual slash, and use of existing skid trails would keep sediment movement to a minimum.

Vegetated buffer widths ranging from 40 to 100 feet are sufficient to prevent sediment from reaching streams (Burroughs and King 1989, Corbett and Lynch 1985, Swift 1985). Project design features include at least 55 feet buffers adjacent to treatment units. The proposed 55 foot buffers would be expected to capture sediment prior to reaching stream channels. These buffers combined with residual slash remaining following treatment should obstruct flow paths and keep sediment movement to a minimum. Slash, limbs and non-merchantable material left following harvest activities within treatment areas can substantially reduce the magnitude of sediment movement (Burough and King 1989, Swift 1985). As the proposed actions are not likely to measurably alter water quality characteristics at the treatment sites, they would be unlikely to alter aquatic habitat downstream from the project area.

Road Construction/Renovation

The proposed action includes the construction of approximately three miles of new road. All new construction would be seasonally restricted to occur during the dry season, typically May thru October then winterized or decommissioned following harvest. Based on location of new ridgetop roads and seasonal restrictions, road construction is unlikely to increase sediment or stream flows which may alter stream channels and fish habitat.

Flows Effects

Construction of 750 feet of new road associated with Project 1 would occur within 1 site potential tree height (210 feet) of stream channels, none within 100 feet of any streams. The proposed road construction is unlikely to increase the drainage network in the watershed as the majority of new road is located on ridge tops, generally outside riparian reserves, and no new construction would cross any existing stream channels. Thus, impacts to aquatic habitat downstream would not be anticipated.

Temperature Effects

The channels nearest these new road construction are intermittent, thus not subject to elevation of stream temperatures during summer months. In addition, the existing buffer distance of 100 feet or more between the road and the stream would further limit any increase in solar radiation reaching the stream channel. According to the stream shading sufficiency analysis done for the project area treatment units, the proposed SPZs of 55 feet was sufficient to protect critical shade in the primary shade zone, based on topography and average tree height (Snook 2009). Thus, new road construction would be highly unlikely to have any affect on stream temperatures at the site and highly unlikely to impacts aquatic habitat or fish downstream.

LWD Effects

Road construction has the potential to alter LWD recruitment to streams at the site level. Stand exam data shows the tallest 40 trees adjacent to road segments of Buck Peak unit 11A and Road P9 and unit 1B and Road P5 are shorter than the distance separating the road to the nearby streams (Snook 2009). New road construction would not be anticipated to impact LWD recruitment in the short-term at these sites.

Stand changes on road segments of Bummer Ridge unit 31A-P9 and Buck Peak unit 1B-P5 may affect recruitment potential on up 200 feet of road as these segment lengths are within the existing tree height of the local stream channels. The proposed new road construction would affect less than 1/3 of an acre within the existing stand height of non-fish bearing streams. The small area affected combined with distance of new construction from fish habitat indicates changes to LWD recruitment where fish reside would be unlikely in the short-term.

The total area of road within the RR LUA affected is very small, less than 9/10 of an acre. The proposed road location areas (on or near ridge tops) all of which are located on low gradient slopes, would have extremely low susceptibility to mass movement. The long-term impacts of road construction would be undetectable to fish and aquatic habitat downstream. The proposed road work may also have modest benefit to the stands creating openings in the adjoining canopy and locally stimulating growth, thus potentially enhancing the quality of LWD recruitment from stands adjacent to the roads.

Sediment Effects

Proposed road construction would occur at least 100 feet from streams. Vegetated buffer widths ranging from 40 to 100 feet are sufficient to prevent sediment from reaching streams (Burroughs and King 1989, Corbett and Lynch 1985, Swift 1985). Therefore the proposed road locations, with buffers of 100 feet or more, would not be expected to transport sediment to stream channels. Based on location of new roads and seasonal restrictions, road construction is unlikely to increase sediment which may alter stream channels and fish habitat.

The proposed road renovation work is intended to improve drainage and road surface conditions, resulting in less erosion into the surrounding area over time. Short-term impacts to fish or aquatic habitat may occur from the proposed renovation of 30 miles of road associated with the proposed action. The majority of renovation is not in proximity to fish bearing streams and would not impact fish or aquatic habitat. All road renovation work would be seasonally restricted to occur during the dry season, typically May thru October. The proposed road renovation treatments (rocking, grading, ditchline and cross drain replacements) would be expected to result in a minor short-term increase in erosion reaching associated crossings in the winter following work (Wegner 2009). Renovation of roads over fish bearing crossings would result in local short-term increases in sediment reaching the stream channel. This increase in sediment could have local short-term (one year during initial winter freshets) negative affects to aquatic species.

Replacement of up to 30 stream crossing sites may have short-term impacts on fish and aquatic habitat. The majority of proposed crossings are located on non-fish bearing intermittent tributaries. These small ephemeral/intermittent streams would be expected to store coarse sediment washed from roads. Generally, sediment and turbidity generated from renovating these non-fish bearing crossings occurs during winter freshet events when background sediment and turbidity is also elevated, thus the increase in sediment and turbidity which may be generated by culvert work would be undetectable against background conditions. Undetectable changes in sediment and turbidities makes proposed treatment on these streams unlikely to impact fish habitat downstream.

Treatment of culverts on intermittent fish bearing channels would not be anticipated to have any direct impacts to fish, as fish would not be present during project activities. Any impacts would be delayed until flow initiation during the fall or winter. Culvert replacement may result in local short-term increases in sediment reaching the stream channel during initial winter freshets. This increase in sediment could have local short-term negative affects to aquatic species until the adjoining channel adjusts to the new structure. Generally, adjustments would occur within the first year following installation.

The proposed action includes replacement of four culverts on perennial streams more than ½ mile from fish habitat. One study (Foltz et al, 2008) of culvert replacement impacts on sediment and turbidity, conducted in Idaho, indicated discernable turbidity was transported no more than ½ mile from the treatment sites. Based on these results it would be unlikely that site level impacts of culvert replacement on these four perennial streams would result in impacts to fish habitat more than ½ mile downstream.

Treatment of culverts on perennial streams less than ½ mile from fish habitat may experience direct and indirect short-term negative impacts to aquatic habitat and individual fish. Six of the crossing treatments on perennial streams are less than ½ mile from fish habitat, four crossings are located on fish bearing streams. The stream bottom would be locally disturbed by the removal of the culverts and

exposure of the underlying sediment to surface flows. These impacts would result in local short-term increases in sediment reaching the stream channel. This increase in sediment could have local short-term negative affects to aquatic species. Rehabilitating disturbed stream banks by seeding native grasses upon completion would accelerate recovery of riparian vegetation and protect bank stability. Banks and riparian vegetation disturbed by construction would stabilize after the first winter.

Resident fish may be directly negatively affected as a result of proposed dewatering or displacement due to disturbance of the stream channel during culvert removal. The affects would be short-term, one summer, assuming that surface flows and substrate would recover to pre-project conditions after the first winter freshets. In the long-term the proposed culvert treatments would maintain habitat access, reduce sediment recruitment to the stream channel, and allow recovery of the stream channels thru the crossing sites to near natural function.

Timber Hauling

The potential for timber hauling to generate road sediment is minimized by project PDF's (Section 2.3.2). The majority of the sale area and haul roads are located near the ridge lines and are graveled (Map 1). Winter haul would occur on rocked road surfaces only. Any native surface roads would be restricted to dry season use only. Buffer distances of at least 200 feet would be expected to capture the majority of sediment generated from hauling on road surfaces before reaching fish habitat (Burroughs and King 1989, Corbett and Lynch 1985, Swift 1985, Belt et al 1992). Spot rocking and minor road grading would occur to maintain road surface conditions. Hauling operations would be suspended if weather or environmental conditions pose an imminent risk of road sediment flowing in road ditches. Roads located more than 200 feet from fish habitat would be unlikely to transport sediment which would reach fish habitat.

Based on field review of hauls roads 13-7-10 and Baker Creek Road, neither road is directly over fish habitat. Wet season hauling on these road segments may result in site level increase in sediment transport to several non fish bearing streams (see map #4). Research has demonstrated that relatively short segments of small ephemeral/intermittent streams (300 to 400 feet) can effectively store coarse sediment washed from roads which would in turn contribute to protection of water quality in fish bearing habitat downstream (Duncan et al, 1987). Sediment entering these small non-fish bearing intermittent tributaries in the project area would likely be retained in the channel bedload prior to reaching fish habitat and delivered only during high flow events when background sediment levels would also be elevated. Turbidity generated from hauling over non-fish bearing crossings may occur during winter freshet events when background turbidity is also elevated. The small increase in turbidity which may be generated by hauling on these roads would be undetectable against background turbidity where fish reside; thus unlikely to impact fish and aquatic habitat.

The proposed hauling on Roads 14-7-18 and 14-7-19 in proximity to resident fish is not expected to result in detectable quantities of sedimentation reaching fish bearing streams with the implementation of dry season restrictions. Minor short-term pulses in sediment may reach the streams associated with the haul route crossings during the onset of initial winter storm events. There is one stream crossing (bridge crossing over South Fork Alsea River) located on Road 14-7-18. This low gradient road has heavily vegetated ditchlines and would have limited potential to transport sediment (Luce and Black 1999).

Three stream crossings on the 14-7-19 road may connect ditchlines to small intermittent channels. Research has demonstrated that relatively short segments of small ephemeral/intermittent streams (300 to 400 feet) can effectively store coarse sediment washed from roads which would in turn contribute to protection of water quality in fish bearing habitat downstream. Sediment entering the small non-fish bearing intermittent tributaries in the project area would likely be retained in the channel bedload prior to reaching fish habitat and delivered only during high flow events when background sediment levels would also be elevated. Turbidity generated from hauling over non-fish bearing crossings may occur during winter freshet events when background turbidity is also elevated. The small increase in turbidity which may be generated by hauling would be undetectable against background turbidity where fish reside, thus unlikely to impact fish and aquatic habitat..

Wet-season hauling on Roads 14-7-24, 14-6-17, 14-6-9, 14-8-24.3, and 14-8-13 include crossings over fish bearing streams. Crossings over fish bearing streams may have direct short-term connections of road surface flows with stream channels. Cessation of hauling during heavy rainfall periods, (when road surface flows are most likely to be connected to stream channels) would minimize the extent of sediment being disturbed and subsequently available for transport to the stream channel. Minor site specific impacts to short reaches of fish habitat downstream of these stream crossings could occur due to sediment generated from hauling. Resident fish may experience short term direct negative affects as a result of proposed wet season hauling due to localized increase in turbidity in the stream channel. Application of sediment control PDFs [(project design features) (silt fences, hay bales etc…)] and cessation of haul during heavy rainfall would minimize the magnitude of sediment reaching streams. The duration of sediment reaching streams would be short-term, occurring during the wet seasons during and immediately following hauling activities.

Machine and Hand Pile Burning

Burning piles could produce small areas susceptible to erosion and restricted infiltration (Wegner 2009). However, burn areas would be surrounded by buffers and no burning would occur in SPZs. Vegetated buffer areas ranging in width from 40 to 100 feet appear to prevent sediment from reaching streams (Burroughs and King 1989, Corbett and Lynch 1985, Swift 1985). The SPZ's associated with the project, a minimum of 55 feet, would be expected to provide sufficient distance from the streams to capture any surface erosion from pile burning treatments. Slash burning with the use of these mitigating features is not anticipated to negatively impact the aquatic environment.

3.1.5.3 *Alternative 3 (Buck Peak Road Haul Route)*

The only changes to be analyzed under this alternative include the modification of the proposed haul routes associated with the Buck Roberts project area and the changes in road renovation on the affected road segments. The haul route would vary from the proposed action alternative to include a route that would exclude the Peak Creek low water ford and provide for year round haul. The proposed alternate haul route is contained within the Upper Alsea River 5th Field Watershed. The relevant fish bearing stream in proximity to the alternate haul route is Peak Creek draining to the South Fork Alsea River.

The majority of the Buck Peak Road haul route is located near ridge lines and is graveled. Buffer distances of at least 200 feet would be expected to capture the majority of sediment generated from hauling on road surfaces before reaching fish habitat (Belt et al 1992). Based on the location of majority of the alternate haul route, combined with the distance from fish habitat, sediment transport would be unlikely to reach fish habitat.

Wet-season hauling on Road 13-6-29 includes crossing over a fish bearing stream. Crossing over the fish bearing stream would have direct short-term connections of road surface flows with stream channels. Cessation of hauling during heavy rainfall periods, (when road surface flows are most likely to be connected to stream channels) would minimize the extent of sediment being disturbed and subsequently available for transport to the stream channel. Minor site specific impacts to short reaches of fish habitat downstream of these stream crossings could occur due to sediment generated from hauling. Application of sediment control PDFs (silt fences, hay bales etc…) and cessation of haul during heavy rainfall would minimize the magnitude of sediment reaching streams. The duration of sediment reaching streams would be short-term, occurring during the wet seasons during and immediately following hauling activities.

Road Renovation

Short-term impacts to fish or aquatic habitat may occur from minor renovation of the Buck Peak Road haul route to provide winter haul. The majority of road is not in proximity to fish bearing streams and would not impact fish or aquatic habitat. All road renovation work would be seasonally restricted to occur during the dry season, typically May thru October. Road renovation treatments (rocking, grading, ditchline reconstruction, and cross drain replacements) would be expected to result in a minor short-term increase in erosion reaching associated crossings in the winter following work, until reestablishment of vegetation in the subsequent growing seasons.

Utilization of the Buck Peak Road Haul Route could include the replacement of a culvert on a perennial stream more than 1½ miles from fish habitat. One study (Foltz et al, 2008) of culvert replacement impacts on sediment and turbidity, conducted in Idaho, indicated discernable turbidity was transported no more than ½ mile from the treatment sites (Foltz et al 2008). Based on these results, it would be unlikely that site level impacts of culvert replacement on this perennial stream would result in impacts to fish habitat more than 1½ miles downstream.

Conifer Release (Project 2)

3.1.5.4 *Alternative 1 (No Action)*

Current conditions would be maintained. Conifer development and coarse wood recruitment rates would be unchanged and stand conditions would also remain unchanged. Impacts to aquatic habitat would be unlikely with the implementation of the no-action alternative. Expected benefits, improving CWD and LWD recruitment patterns through conifer release would not be realized thus long-term wood retention rates would be lower than under the proposed action.

Conifer Release (Project 2)

3.1.5.5 *Alternative 2 (Proposed Action)*

Yarding/Falling

Flow Effects

The proposed actions are all located near fish bearing streams. The hydrology analysis, based on the 2008 FEIS flow analysis, determined that no impacts to stream flows were anticipated (Wegner 2009). Assuming that no discernable changes in peak and base flows within the treatment area are anticipated, no effects to fish habitat would be anticipated. Except for unit 19D adjacent to Tobe Creek and unit 7D adjacent to Fall Creek, the streams within 100 feet of project units are intermittent / ephemeral, which are not subject to summer solar warming. Retention of the 55 foot SPZ buffer and the location

of treatments adjacent to intermittent channels would be expected to maintain the existing stream temperature regimes.

Unit 19D and 7D are between 55 and 80 feet from perennial streams. Protection of stream shade is the critical component in protecting stream temperature regimes (Beschta et al 1989, Belt et al 1992, Moore et al 2005). According to the stream shading sufficiency analysis done for the proposed treatment units, the proposed SPZ of 55 feet was sufficient to protect critical shade in the primary shade zone within unit 19D and 7D, based on topography and average tree height (Snook 2009). The proposed vegetation treatment in the secondary shade zone (approximately one tree height from the stream) would not result in canopy reduction of more than 68 percent. Protection of stream shading thru application of SPZs and silviculture prescriptions retaining adequate canopy cover would be expected to maintain the existing stream temperature (Wegner 2009).

Based on the shade sufficiency analysis, the hydrology report water quality analysis, and the project design features, the proposed actions are unlikely to impair fish habitat both at the treatment site and downstream.

LWD Effects
Red alder may provide sources of instream structure over the short-term; however, red alder generally does not attain diameters as large as most native conifer species and tends to be less persistent in the aquatic environment than conifer. Wood recruitment studies conducted in the Pacific Northwest have shown the majority of woody debris recruitment occurs within 59 to 65 feet of the stream edge (McDade et al 1990, Van Sickle and Gregory 1990, Meleason et al 2002). The proposed SPZ width, which accounts for 85 percent of this woody debris recruitment zone, is anticipated to maintain wood recruitment rates. Therefore, the proposed actions are not expected to cause any short-term effects to aquatic habitat at the site or downstream.

Proposed thinning in the RR LUA areas are anticipated to increase the average growth of the remaining trees by 15 percent over 30 years and increase the total amount of conifer in the stand compared to not treating the stands (Snook 2009). Over time, these trees would be expected to become wood sources for adjacent stream channels. In the long-term the presence and increase in the size of conifers in RR LUA could benefit LWD recruitment to the stream channel, thus potentially improving the quality/complexity of aquatic habitat adjacent to the treatment areas in the future.

Fish habitat varies between 55 feet and 725 feet downstream from the Project 2 treatment areas. The South Fork Alsea Watershed Analysis (BLM 1995) and the Lower Alsea River Watershed Analysis (BLM 1999) assessed mass movement risk in the watershed, including the project area. The South Fork Alsea River analysis indicted the risk of movement was high in unit 19D adjacent to Tobe Creek and low for unit 26A adjacent to Record Creek (BLM 1995 see Map #3). The Lower Alsea River Watershed Analysis indicated risk of movement was low for units 7A thru 7D near Fall Creek (BLM 1999 see Map #5). The small stream channels near treatment units (26A, 7A-7D) are modest gradients, and would have a limited capacity to transport wood.

Based on this assessment, the proposed treatment in unit 19D draining to Tobe Creek may remove trees from slopes that are at-risk of mass movement thus are a potential source of LWD to fish habitat. The at-risk treatment areas in Tobe Creek (unit 19D) would be cable yarded to the existing road. Site level compaction of soils and ground disturbance would be minimal on cable ground with one end suspension and the small diameter (mean diameter of 11.5 inches) of harvested trees. The proposed

treatments including retention of stream side buffers at least 55 feet, post-treatment Relative Density (RD) of 0.35, trees per acre (TPA) retention of 170, one end suspension, and the very small area treated within 100 feet of streams suggest treatment is highly unlikely to increase mass movement risk at the site. Therefore, impacts to fish and aquatic habitat downstream would be unlikely.

Sediment Effects
The proposed project actions are unlikely to result in any measurable changes in sediment delivery to the surrounding stream network, which could impact the turbidity, substrate composition, or the sediment transport regimes (Wegner 2009). The proposed buffers separating proposed actions from fish habitat are at least 55 feet. Vegetated buffer widths ranging from 40 to 100 feet are sufficient to prevent sediment from reaching streams (Burroughs and King 1989, Corbett and Lynch 1985, Swift 1985). Therefore, the proposed buffers would be expected to capture sediment prior to reaching stream channels. These buffers combined with residual slash remaining following treatment would obstruct flow paths and keep sediment movement to a minimum. Slash, limbs and non-merchantable material left following harvest activities within treatment areas can substantially reduce the magnitude of sediment movement (Burough and King 1989, Swift 1985). As the proposed actions are not likely to measurably alter water quality characteristics at the treatment sites, they would be unlikely to alter aquatic habitat downstream from the project area.

Hauling – The haul route in Fall Creek (units 7A thru 7D) includes 2.6 miles of road within 100 feet of fish habitat and crosses fish habitat six times. Minor site specific impacts to short reaches of fish habitat downstream of these stream crossings on Fall Creek Road may occur due to sediment generated from hauling. Based on road conditions, the quantity of sediment generated would be small and localized. Low gradient roads with heavily vegetated ditchlines have limited potential to transport sediment (Luce and Black 1999). Any turbidity generated from hauling would most likely occur during initial winter freshet events when background turbidity is also elevated. The small increase in turbidity which may be generated by dry season hauling on this road would likely be undetectable against background turbidity where fish reside; thus impacts of dry season hauling to fish and aquatic habitat would be undetectable.

The haul route in Record Creek (unit 26A) includes 200 feet of road within 100 feet of fish habitat. The 14-8-26 road has only one stream crossing, over the fish bearing portion of Record Creek. There is minimal ditchline that could direct flow and sediment towards Record Creek from the 14-8-26 road and the existing ditchline is heavily vegetated. Low gradient roads with heavily vegetated ditchlines have limited potential to transport sediment (Luce and Black 1999). With the combination of dry season haul, heavily vegetated ditches, and crowned road segments to keep water off the road surface, the probability of increased sediment delivery to Record Creek is highly unlikely and impacts to fish and aquatic habitat would be unlikely.

The haul route to conifer release treatment in unit 19D is the same as the primary haul route of the Bummer Ridge treatment on the 14-7-18 and 14-7-19 roads addressed in project 1. Proposed dry season hauling on the 14-7-18 and 14-7-19 roads were not expected to result in detectable quantities of sedimentation reaching fish bearing streams.

Road Renovation – Short-term impacts to fish or aquatic habitat may occur from the proposed renovation of 0.5 mile of road associated with the proposed action. The majority of renovation is not in proximity to fish bearing streams and would not impact fish or aquatic habitat. All road renovation work would be seasonally restricted to occur during the dry season, typically May thru October.

Treatment of culverts on perennial streams less than ½ mile from fish habitat may experience direct and indirect short-term negative impacts to aquatic habitat and individual fish. These impacts would result in local short-term increases in sediment reaching the stream channel. This increase in sediment could have local short-term negative effects to aquatic species downstream. Rehabilitating disturbed stream banks by seeding native grasses and brush upon completion would accelerate recovery of riparian vegetation and protect bank stability. Banks and riparian vegetation disturbed by construction would stabilize after the first winter.

3.1.6 **Fuels\Air Quality**

(IDT Reports incorporated by reference: Upper Lower Alsea River Fuels Report pp. 1 to 7)

Affected Environment

Mid-Seral Enhancement (Project 1)

Fuels:
There is a light to moderate accumulation of small and medium diameter dead woody material and leaf litter on the ground in most of the stands. There are scattered areas with heavy accumulations of medium and large diameter logs where wind throw has occurred. Larger (20 inches + diameter) downed logs are more common in the older stands where wind throw has occurred, otherwise, there are scarce large snags. Small snags less than 12 inches DBHOB are fairly common.

Total dead fuel loading in the timber stands ranges from 10 up to 25 tons per acre on the majority of sites. On sites with substantial amounts of wind throw, the fuel loading would range up to 60 tons per acre. Much of the existing down material is rotten or only partially sound.

Conifer Release (Project 2)

Fuels:
There is a minimal accumulation of small and medium diameter dead woody material and leaf litter on the ground in most of the stands. There are a few scattered larger (20 inches+ diameter) downed logs left from previous logging in some of the areas. Very few snags are present.

Dead fuel loading in these hardwood dominated stands ranges from 3 up to 8 tons per acre on the majority of sites. On sites with scattered old logs, the fuel loading would range up to 30 tons per acre. Much of the existing down material is rotten or only partially sound.

Mid-Seral Enhancement (Project 1) and Conifer Release (Project 2)

Air Quality:
Air quality in the area of the proposed projects is generally very high due to the location of the project areas in the Oregon Coast Range. Transport winds affecting the areas generally come in off the ocean and keep the air shed scoured out preventing a buildup of particulate matter. Occasional stagnant air conditions do develop during the burning season and may result in accumulation of particulate matter but generally these are short lived lasting less than 1 week.

Environmental Effects

3.1.6.1 ***Alternative 1 (No Action)***

Mid-Seral Enhancement (Project 1) and Conifer Release (Project 2)

This alternative would result in no immediate change to the affected environment. Short-term impacts to fuels and air quality would be avoided. Longer term fuel loadings and crown density would increase and there would be no reduction in the risk of a crown fire occurring in the untreated stands.

3.1.6.2 ***Alternative 2 (Proposed Action)***

Mid-Seral Enhancement (Project 1)

Fuels:
Fuel loading, risk of a fire start and the resistance to control a fire would all increase at the sites as a result of the proposed action. Depending on the level of treatment in the various units, slash created from timber harvest would add an estimated 5 to 15 tons per acre of dead fuel to the treatment areas.

In the stands that would be commercially thinned, 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. Within one year, the risk of a fire start greatly diminishes as the dead needles and fine twigs break off, fall to the surface, absorb moisture and begin to decay. With the increased sunlight to the ground there would be increased sprouting and germination of shrub and forb vegetation. This new vegetation growth would increase the shading and humidity near the ground level raising the moisture level of the surface fuels thus reducing the risk of ignition. If a fire does start, the increase in green vegetation greatly reduces the fire intensity and spread rate due to heat absorption by the moisture contained in the green vegetation. In addition the stems and leaves of the green vegetation would block or reflect much of the heat generated by the fire and slow down the rate heat transfer and preheating of adjacent fuel which is a critical key component of fire spread. Observations by this author 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 following logging, resistance to control would also decrease over time but more slowly. This longer time horizon is due to the fact that larger material takes longer to decay and thus stays on the site for a longer time period. Since large size class fuels are a key component in resistance to control (i.e. it takes more effort and water to extinguish these fuels) the resistance to control would decline at a slower rate commensurate with the decay rates of the larger size class material left on site. This is what is expected to occur for the areas considered in this proposed action where the slash created would be left in place, untreated.

The effect of decommissioning and blocking the majority of the new roads in the project areas would be an increase in the response time and the effort needed by ODF (Oregon Department of Forestry) or BLM to control a fire in the area since access is restricted. This negative effect is somewhat offset by the fact that most fires in this area are human caused. By restricting access, the risk of a fire starting in the area should be lower. Fire records for the Salem District over the past 20+ years show that the majority of the non industrial operation, human caused fire starts have occurred alongside roads, on landings at the end of roads or along trails. Subsequently, by restricting access, fire starts within the

proposed treatment areas would be less than if roads and access were to remain open. The use of gates during the high fire danger season has been used by private and federal land owners in this region for a number of years with good success in preventing fire starts.

Conifer Release (Project 2)

Fuels:
Fuel loading, risk of a fire start and the resistance to control a fire would increase minimally at the sites as a result of the proposed action. Depending on the level of treatment in the various units, slash created from timber harvest would add an estimated 10 to 20 tons per acre of dead fuel to the treatment areas possibly less if the market for alder logs and chips is good.

Because the slash added to the treated sites is primarily hardwood slash, the risk of a fire start in the untreated slash would only be slightly higher during the first few seasons following cutting. Fire risk would diminish as the area "greens up" with under story vegetation, and as the fine twigs and branches in the slash begin to break off and collect on the soil surface.

Past experience, in the geographic area of this proposed action, has shown that, within 3 to 5 years, untreated hardwood slash would generally decompose to the point where it no longer contributes significantly to increased fire risk. Depending on the amount of large, down wood left on site from logging, the resistance to control would also decrease over time but more slowly. The resulting total residual dead fuel loading would vary throughout the sites ranging from 10 to 25 tons per acre in areas with few down logs. Where there are a few large logs left in place to meet coarse wood requirements, these logs would add an additional 10 to 25 tons per acre to the residual dead fuel loading. It is expected that on most of these sites, the fuel loading would be on the low side of the estimates given. Most of the dead fuel tonnage to be left on site following treatment would be in the form of slash pieces in the 3 to 8 inch size class plus the few scattered older down logs.

Mid-Seral Enhancement (Project 1) and Conifer Release (Project 2)

Air Quality:
Because there are several proposed timber sales making up this proposed action it is expected that only a portion of the total would be available for burning at any given time. As such, the total amount of slash debris expected to be piled and available for burning on a given day is estimated to be approximately 200 to 600 tons from the landings and treated areas along the roads. Burning up to 600 tons of dry, cured, piled fuels under favorable atmospheric conditions in the Oregon Coast Range under the guidance of the OSMP (Oregon Smoke Management Plan) administered by the local ODF offices is not expected to result in any long term negative effects to air quality in the air shed. Because the fuel would be located in individual piles, burning on a given day can easily be adjusted to the amount that fits within OSMP guidelines for the day.

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. 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. The strong convection column produced carries the smoke and gases well up into the atmosphere where it is diluted and carried away in the air mass. After a few hours, as the piles burn down and the intensity subsides, additional smoke may be produced due to lower temperatures and less efficient combustion.

Depending on size, arrangement, type and moisture content of the remaining fuel, the smoke would diminish over several hours or days as the piles cool and burn out (sooner if rain develops). Generally this later smoke only affects the immediate area (¼- ½ mile or less) around the pile. If a temperature inversion develops over the area during the night time hours, smoke may be trapped under the inversion and accumulate, resulting in a short term impact to the local air quality (generally the area within 1 mile or less from the burn area). The accumulated smoke generally clears out by mid-morning as the inversion lifts.

Due to the location of these projects (1,000 feet to 1,400 feet elevation in an area with good exposure and air flow), it is unlikely that inversions would result in conditions where local smoke would be confined and accumulate under the inversion beyond mid-afternoon. Burning of slash would always be coordinated with ODF and conducted in accordance with the Oregon State Smoke Management Plan. This serves to coordinate all forest burning activities on a regional scale to prevent negative impacts to local and regional air sheds. Guidance under the OSMP would always prevent or severely limit burning anytime the weather forecasts indicate there is a likelihood of a stagnant air or persistent inversion situation developing.

3.1.7 **Recreation/Visual Resources/Rural Interface**

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

Affected Environment

Mid-Seral Enhancement (Project 1) and Conifer Release (Project 2)

Recreation

The project area is dispersed recreation with no developed recreation sites. Off-highway vehicle (OHV) usage of the area is restricted to designated roads and trails. No designated trails exist in the project area. Activities that may occur in the area include OHV riding, biking, hunting, target shooting, driving for pleasure, and special forest product harvest. Any unauthorized trail would be obliterated through the implementation of the proposed project. Many roads are gated, thus restricting traffic.

Visual Resource Management (VRM)

Visual Resource Management (VRM) of this area is VRM class 3 and 4 based on current project acreage information and ArcGIS data layers for VRM on the Salem District.

On VRM 3 lands, management objectives include "Manage visual resource class 3 lands for moderate levels of change to the characteristic landscape. Management activities may attract attention but should not dominate the view of the causal observer. Changes should repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape" (RMP p. 37). In highly visible areas, grass/legume seeding, intensive debris disposal, and selective leaving of trees or brush are employed on occasion to mitigate management impacts of harvest projects. There are approximately 46 total acres within VRM class 3 within the project areas.

On VRM 4 lands, management objectives include "Manage visual resource management class 4 lands for moderate levels of change to the characteristic landscape. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the effect of these activities through careful location, minimal disturbance, and repeating the basic

elements of form, line, color, and texture" (RMP p. 37). There are approximately 764 total acres within VRM class 4 within the project areas.

The project units are in the foreground to middle ground from State Highways #201 and #34. The project units are not adjacent to major roads, are in the distance when looking from major public travel routes, and may not be observable since the rolling mountains, remaining trees, and vegetation block the view. Traffic speeds reduce the time any unit is visible. BLM managed lands are unidentifiable from other lands when looking at the landscape except that the majority of recent (less than 15 years old) clearcuts are located on privately owned lands.

Rural Interface Zone

Portions of the proposed project areas are within rural interface zone areas. Rural interface zones within Project 1 are located in Township 14 South, Range 7 West, Section 19, Township 14 South, Range 8 West, Section 25 and Township 14 South, Range 7 West, Sections 19 and 30. Rural interface zones are in all portions of Project 2 except Township 13 South, Range 8 West, Section 7. The haul routes would pass residential houses along Highways #201 and #34 and pass through rural interface zones.

In general, the concerns of property owners near timber harvest and hauling activities tend to be associated with noise, traffic, and dust from logging and hauling activities, effect to scenic, water and wildlife values, increased public access that may lead to problems with fire hazard, garbage, dumping, and vandalism. Roads surrounding these proposed units have historically experienced log truck traffic.

Environmental Effects

3.1.7.1 ***Alternative 1 (No Action)***

Mid-Seral Enhancement (Project 1) and Conifer Release (Project 2)

With the exception of unexpected changes (i.e. wildfire or disease), the proposed units would continue to provide a forest setting for dispersed recreation opportunities and local residents. A three to five year increase in log truck traffic, noise and other disturbances related to the harvest of the proposed units would not occur. Timber management activities and log truck traffic would continue on both private and public lands in the vicinity. No modifications to the landscape character of the project area would be expected to occur. Modifications to the landscape character in the area around the projects would still be expected, as a result of activities on other lands.

3.1.7.2 ***Alternative 2 (Proposed Action)***

Mid-Seral Enhancement (Project 1) and Conifer Release (Project 2)

Recreation

Dispersed recreation use within the proposed units would be restricted approximately three to five years during timber management activities and return to prior usage upon completion of harvest. Other BLM lands nearby would remain available for recreational opportunities. Recreational users in the vicinity would hear the noises of the timber sale operations and experience traffic delays of minutes to hours. Harvest activities would obliterate any unauthorized trails. No reconstruction of unauthorized trails would be allowed.

Existing gates would continue to restrict vehicle access and reduce unauthorized off-highway vehicle misuse of resources. Passing vehicles and OHVs could create a fire ignition source for stumps and logging debris from vehicle sparks (from lack of proper spark arrestor or catalytic converter in the muffler system), heating grasses (fine fuels) from idle vehicles, or tossing out burning materials such as cigarettes.

Visual Resources

The proposed projects would comply with VRM objectives. Visual disturbance of the project area would be associated with modifications to vegetation and other ground disturbing activities from timber sale operations. Understory vegetation and the remaining trees would rebound, grow, and continue to green up covering logging debris and burn pile scars. Project design features, (ie. slash treatments and grass seeding), time in view and unit locations mitigate any adverse effect to scenic resources according to VRM class 3 and 4 objectives. Evidence of harvest activities would not be observable within five years as understory vegetation returns to a more natural appearance and the remaining stand continues to mature. A forest setting and most of the canopy would remain.

Harvest activities would remove a portion of trees from the proposed units leaving undergrowth vegetation crushed. Logging debris and crushed undergrowth vegetation would continue turning brown to red as it dies leaving the view of the units undesirable. Fuel treatment of logging debris if burned would result in short-term decline in visual quality from smoke leaving the units blackened. .

Rural Interface Zone

Residences along the haul route and in close proximity to timber harvest activities may hear equipment and helicopters harvesting trees, noise from log truck traffic, experience dust from gravel road traffic, and experience delays for safety. Disturbance from this proposed timber harvest would be short-term lasting a few weeks to months. The project would have no effect on rural interface zones other than increased log truck traffic.

3.1.8 **Carbon Sequestration (Storage) and Climate Change**

On July 16, 2009, the U.S. Department of the Interior withdrew the Records of Decision (2008 ROD) for the Western Oregon Plan Revision. The information contained in the Final Environmental Impact Statement for the Revision of the Resource Management Plans of the Western Oregon Bureau of Land Management (2008 FEIS) is relevant since it examined recent and applicable science regarding climate change and carbon storage. That analysis concluded that effects of forest management on carbon storage could be analyzed by quantifying the change in carbon storage in live trees, storage in forests other than live trees, and storage in harvested wood. The discussion on Volume I, Pages 220-224; Volume II, Pages 537-543, and Volume III, Appendices, Pages 28-30 are relevant to the effects analysis for this project and are incorporated by reference

Context –Greenhouse Gases, Climate Change and the Spatial Scale for Analysis

Greenhouse Gases, Climate Change and the Spatial Scale for Analysis

Uncertainty about the nature, effects and magnitude of the greenhouse gases and global climate change interrelationship is evident in a wide range of conclusions and recommendations in the literature reviewed. However, Forster et. al. 2007 (pp. 129-234), which is incorporated here by reference, concluded that human-caused increases in greenhouse gases are extremely likely to have exerted a substantial effect on global climate. The U.S. Geological Survey, in a May 14, 2008 memorandum to the U.S. Fish and Wildlife Service, summarized the latest science on greenhouse gases and concluded that it is currently beyond the scope of existing science to identify a specific source of greenhouse gas emissions or sequestration and designate it as the cause of specific climate impacts at a specific location. This defines the spatial scale for analysis as global, not local, regional or continental. That memorandum is incorporated here by reference. Based on the BLM's review of statutes, regulations, policy, plans and literature, the BLM accepts the conclusions above as appropriate context for a reasoned choice among alternatives.

Context – Temporal Scale for Analysis

The BLM has selected fifty years as the analysis period of carbon storage for this project, because it encompasses the duration of the direct and indirect effects on carbon storage. In fifty years, stands in the project area will have nearly returned to current carbon storage levels, and carbon storage will have offset carbon emissions resulting from harvest.

Context – Calculations of Carbon Storage, Project Area Scale

The purpose of the calculation of carbon storage is to provide a basis for determining significance of carbon storage relative to the temporal and spatial scale. The BLM used site specific data from stand exams as input to the ORGANON stand growth model (v. 8.2, 2006) to predict stand growth to calculate live tree carbon under of each alternative. Calculations from Smith et. al, 2006 were used to calculate carbon in the 'other than live trees' category.

Greenhouse gas emission from harvest operations are based on empirical analysis of fuel use per thousand board feet from past timber sales. The estimates of emissions from prescribed fire (burning of landing piles) are based on quantity of slash accumulations typically produced in similar projects.

The *2008 FEIS* analyzed carbon stored in harvested wood in the using a factor from Smith et al. 2006, p. 35 for converting board feet of harvested wood to carbon. Based on information developed after the *2008 FEIS*, this factor has been refined to better account for regionally-specific conditions and the proportion of harvested volume that is typically milled into solid wood products and into processed wood products. Harvest volumes were converted to cubic feet, converted to pounds of biomass, and then to carbon content, yielding an overall conversion factor of 1,000 board feet = 1.326 tonnes of carbon (R. Hardt, personal communication, 11/09). Of this total amount of carbon in harvested wood, 63.8% of harvest volume is considered as sawlogs and 36.2% as pulpwood (GTR RM-199, Table B-6), for evaluation using the storage rates over time from Smith et al. 2006, p. 27. The improved conversion factor is used in this analysis to evaluate the amount of carbon stored in harvested wood. The effect of the 2008 FEIS alternatives on carbon storage has been reanalyzed based on this improved conversion factor. This reanalysis revealed a slight increase in the amount of carbon storage over time for all alternatives and less difference among the alternatives than described in the 2008 FEIS, pp. 537-543, but no change in the magnitude or trend of effects on carbon storage from that described in the 2008 FEIS.

Affected Environment
The 2008 FEIS described current information on predicted changes in regional climate (pp. 488-490) , concluding that the regional climate has become warmer and wetter with reduced snowpack, and continued change is likely. However, b*ecause* of *uncertainty about changes in precipitation, it is not possible to predict changes in vegetation types and condition, wildfire frequency and intensity, streamflow, and wildlife habitat.*

Under average historic conditions (2008 FEIS, p. 3-211), BLM-managed lands in western Oregon stored 576 million tonnes of carbon, 35% more than is currently stored in forests and harvested wood today, due to the greater proportion of young stands on those lands today (2008 FEIS, p. 3-224).

The proposed action (Project 1) is to conduct density management harvest on approximately 772 acres of trees aged 50-70 years old.

Carbon Storage

The following show quantities of carbon in forest ecosystem vegetation[2] in the Coast Range, and in the Upper Lower Alsea project area.

- Total carbon, forest ecosystem vegetation, Pacific northwest, Coast Range 1.8-2 Giga-tonnes (Gt) (Hudiburg, et al. 2009).
- Total carbon, forest ecosystem vegetation, Upper Lower Alsea River Project 1 stands = 167,600 tonnes or 0.0001676 Gt. This represents .001% of the Coast Range total.
- The annual carbon accumulation from forest management in the United States is 191 million tonnes. Current management on BLM-managed lands in western Oregon would result in an average annual accumulation of 1.69 million tonnes over the next 100 years, or 0.9% of the current U.S. accumulation. (WOPR, p. 4-537).

Carbon in forest ecosystem vegetation can be divided into three pools, and form the basis of the analysis for carbon storage and emissions for the Upper Lower Alsea project:

- Live trees (foliage, branches, stems, bark and live roots of trees),
- Forest carbon other than live trees (dead wood and roots, non-tree vegetation, litter and soil organic matter) and
- Harvested wood products.

Emissions of carbon resulting from timber harvest can be divided into several sources:

- Equipment used to harvest and haul logs,
- Disposal of harvest-generated fuels or slash by burning,
- Harvested wood products that are disposed of as waste, burned without energy capture, or discarded over time and allowed to decay.

[2] Carbon contained in both above ground and below ground parts of trees and forest vegetation, and downed wood, litter and duff. It does not include mineral carbon in soil, nor fossil fuels.

Environmental Effects

3.1.8.1 ***Alternative 1 (No Action)***

Under the no action alternative, no greenhouse gases would be emitted from harvest operations or fuels treatments. Carbon stored in live trees would not be converted to the harvested wood carbon pool. A portion of the carbon currently stored in live trees would be converted over time to the forest 'carbon other than live trees' pool through ongoing processes of tree mortality.

After 50 years of growth, live tree carbon would increase to 226,900 tonnes, an increase of 91,600 tonnes from the current level of 135,300 tonnes.

The no action alternative would result in greater net carbon storage over the 50 year analysis period than the proposed action by approximately 88,700 tonnes.

3.1.8.2 ***Alternative 2 (Proposed Action)and Alternative 3 (Alternate Timber Haul Route)***

Total carbon in forest ecosystem vegetation can be divided into three pools: live trees (foliage, branches, stems, bark and live roots of trees), forest carbon other than live trees (dead wood and roots, non-tree vegetation, litter and soil organic matter) and harvested wood products. The proposed action would cause direct effects on greenhouse gas levels by emitting greenhouse gases (specifically, carbon dioxide) from harvest operations and fuel treatment.

Short-term Impacts (0-10 years after timber harvest):

Harvest Operations
Equipment use necessary to harvest *and transport the timber to the nearest mill (Philomath, Oregon) would consum*e *an* estimated *140,060 gallons of fuel*, or total emissions of *3*80 tonnes of carbon. (This includes 194 acres of helicopter yarding, which requires high fuel consumption, and 578 acres of conventional yarding).

Live Trees
Live trees would be removed, decreasing live tree carbon from 135,300 to 59,000 tonnes, and transferring 76,300 tonnes of live tree carbon storage to other pools.

Forest Carbon Other Than Live Trees
Some carbon would be converted to forest carbon other than live trees - dead material that would store carbon and slowly release it through decay. Decay of dead material would result in slow release of carbon under all alternatives, and this analysis assumes that the rate of release would not differ among alternatives, including the No Action alternative. Emissions from decay of dead material are not quantified in this analysis. Burning of landing piles after harvest would result in 170 tonnes of carbon emitted.

Harvested wood
Harvested saw log gross volume of 22,000 mbf would contain 29,690 tonnes of carbon. Much of the emissions from harvested wood occur shortly after harvest. In the first 10 years after harvest, approximately 6,760 tonnes would be emitted.

Long-term Impacts (11-80 years after timber harvest):

Live Trees
Following harvest and coarse wood and snag creation, an average of 40 trees per acre (Bummer and North Fork Overlook areas) or 59 trees per acre (Buck Roberts area) would remain on site, and would store carbon as they grow. Additionally, new tree seedlings are likely to establish and grow, increasing carbon storage considerably. However, in order to avoid prediction error they are not included in this analysis, providing a conservative estimate of carbon storage. Carbon emissions resulting from the proposed action would be offset by carbon storage in tree growth approximately five years after harvest. Live tree carbon would equal the pre-treatment level after 55 years of growth. After 50 years of growth, carbon stored in live trees would be 127,800 tonnes, still 7,500 less than the current (pre-harvest) level of 135,300 tonnes.

Harvested wood
Harvested wood in the Upper and Lower Alsea River Watershed Restoration projects would contain 29,690 tonnes of carbon. From 11-50 years after harvest approximately 2,590 tonnes of carbon would be emitted from harvested wood, totaling 9,350 tonnes (31 percent) emitted without energy capture in the full 50 year analysis period. The balance, approximately 20,335 tonnes (69 percent) of the carbon would remain stored in products still in use and in landfills, or emitted with energy capture (based on regional averages, Smith, et al, 2006, WOPR, Appendix C:30).

Summary of Carbon Storage and Greenhouse Gas Emissions
To summarize, total greenhouse gas emissions resulting from harvest, fuel treatment and harvested wood would be 9,900 tonnes, while storage would equal 12,800 (net storage of 2,900 tonnes) and include the following:

Short-term emissions (0-10 years post-harvest)
- Harvest operations emissions totaling about 380 tonnes
- Fuel treatment (burning) emissions totaling 170 tonnes
- Emissions from harvested wood 0-10 years after harvest of 6,760 tonnes

Long-term emissions(11-50 years post-harvest)
- Emissions from harvested wood, 11 to 50 years after harvest of 2,590 tonnes.

Long-term Storage (50 year analysis period)
- 20,300 tonnes of storage in harvested wood
- -7,500 tonnes net storage in live trees after 50 years of growth

Greenhouse gas emissions and carbon storage over the 50 year analysis period resulting from the proposed action are displayed in Table 17, below.

3.1.8.3 *Comparison of Alternatives*

Table 17. Carbon Emissions and Storage, Comparison of Action and No Action Alternatives

Source	Proposed Action (Tonnes)	No Action Alternative (Tonnes)	Notes
Emissions, 2010-2060	9,900	0	Logging, fuel treatments (burning), and emissions from harvested wood.
Live tree storage, 2059	127,800	226,900	50 years of stand growth
Live tree storage, 2009 (current condtions)	135,300	135,300	68 year old stand, 2009
Net change, live trees	-7,500	+ 91,600	Live tree carbon from growth 2009 - 2059
Harvested wood storage, 2059	20,335	0	69% of harvested wood carbon, 50 years
Total storage increase	**12,800**	**91,600**	Storage: live trees and harvested wood
Net Carbon Storage, Proposed Action	**2,900**	**91,600**	**Storage minus emissions, 2009-2059**

Under the No Action alternative, 44% more carbon would remain stored in live trees than under the Proposed Action during the 50 year analysis period. Under the Proposed Action, carbon would be released through logging, fuel treatments and emissions resulting from harvested wood, the majority (74%) within ten years after harvest. Stand growth subsequent to harvest would store carbon equivalent to those emissions within five years. Therefore, the period where emissions are greater than storage is less than five years, a temporary effect.

Under the No Action alternative, no carbon emissions would occur except for processes not considered in this analysis due to their relatively small effect. Emissions under the Proposed Action would total 9,900 tonnes, equivalent to 7% of the current live tree storage in the project area, and approximately .0000016% of current U.S. annual emissions. The cumulative effect of management of BLM Western Oregon forest lands is a net increase of carbon storage above average historic conditions.

Emissions resulting from the Proposed Action would be small and temporary, and therefore not significant. Furthermore, it is currently beyond the scope of existing science to identify a specific source of greenhouse gas emissions or sequestration and designate it as the cause of specific climate impacts at a specific location.

4.0 Cumulative Effects

4.1 Vegetation

(IDT Reports incorporated by reference: Upper and Lower Alsea River Watershed Restoration Silviculture Riparian abstract pp. 1 to 6, Botanical Report Upper and Lower Alsea River Watershed Restoration 1 to 8)

Age Class:
Due to ecological succession and forest management (mostly private land harvests), the amount of acreage in each age class within this watershed is in constant transition. Ecological succession would advance early seral forest plantations toward mid seral conditions, just as current and expected future harvests of mid seral stands would return these patches to early seral conditions.

Fire history and intensive forest management on both private and public lands over the past several decades has greatly reduced the amount of late seral forests and the quality and quantity of coarse woody debris in western Oregon forests (Moeur, et al. 2005, Hagar 2007). The prevailing management regime on private lands would likely involve alternating between mid seral and early seral habitat conditions over time without retaining any late seral forests patches for the foreseeable future. The proposed action would affect mid-seral stands aged 36 to 71 years but would not change the age class composition on BLM-managed lands in the watershed.

Native vegetation:
The perennial vascular plant species would persist on site post-treatment and their coverage would increase after treatment. As stand canopy again increases over time, conditions would become more similar to current or pre-treatment conditions.

Bureau Special Status Botanical and Fungal Species:
This project area currently provides suitable habitat for rare or uncommon botanical and fungal species. However, any coniferous forest over approximately 50 years of age and located in the northern Oregon Coast Range Mountains provides suitable habitat for rare or uncommon botanical or fungal species. Coniferous forests over 50 years of age are common and widespread in northwestern Oregon. Although this area is considered as suitable habitat, there are no known bureau SS botanical or fungal species known from this area.

Invasive/Non-native Plant Species (including Noxious Weeds):
There would be no effect to Bureau SS species, but the projects would provide for additional habitat at a quicker rate when compared to the no action alternative.

Many past and present management and non-management activities tend to open dense forest settings and disturb soils therefore providing opportunities for widespread non-native plant (NNP) infestations to occur. Most NNP's are not shade tolerant and would not persist in a forest setting as they become out-competed for light as tree and/or shrub canopies close and light to the understory is reduced. In addition many NNP's are early successional species and are replaced by more dense growing shrubs and forbs that are common in western Oregon. The implementation of this project would likely increase the number of common and widespread non-native plant species that are known to occur within the Upper and Lower Alsea River Watersheds. However, as discussed above the risk rating for any adverse cumulative effects to the Upper and Lower Alsea River Watersheds or any adjacent watersheds would remain low.

Examples of forest management activities and natural events within the Benton Foothills Watershed that would create soil disturbance, increase available light, and increase soil temperatures, all of which would influence the spread of NNPs are:

- commercial and pre-commercial timber density management projects;
- young stand maintenance;
- road construction, maintenance, renovation, decommissioning and culvert replacements;
- landslide, high flow sedimentation deposits; and off highway vehicle (OHV) activities.

Activities that do not necessarily create disturbance but influence the spread of weed seeds are recreational hiking, biking, horseback riding, fishing and hunting.

Other sources of seed dispersal are from wildlife movement, water movement, natural dispersal and wind. Many past and present management and non-management activities tend to open dense forest settings and disturb soils, therefore providing opportunities for widespread NNP infestations to occur. Most NNPs are not shade tolerant and would not persist in a forest setting as they become out-competed for light as tree and/or shrub canopies close and light to the understory is reduced. The implementation of this project would likely increase the number of common and widespread non-native plant species that are known to occur within the Benton Foothills Watershed. However, as discussed above the risk rating for any adverse cumulative effects to the Benton Foothills Watershed or any adjacent watersheds would remain low.

4.2 Carbon Sequestration and Climate Change

4.2.1.1 *Alternative 1 (No Action)*

Incremental Effects of Project Related Greenhouse Gases and Carbon Storage:

This increase of 91,600 tonnes of live tree carbon would contribute to an annual average of 1,832 tonnes, or .00009 percent to the U.S. annual accumulation of carbon from forest management of 191 million tonnes. The WOPR EIS (p. 4-538), which is incorporated here by reference, states that by 2056, the No Harvest benchmark analysis (no future harvest of BLM-managed lands in the analysis area, as reanalyzed in November 6, 2009 memo, on file, Marys Peak Resource Area) would result in a total carbon storage of approximately 603 million tonnes, 5 percent higher than average historic conditions (576 million tonnes, WOPR, 3-224).

Greenhouse gas emissions and carbon storage over the 50 year analysis period resulting from the No Action are displayed in Table 17.

4.2.1.2 *Alternative 2 (Proposed Action) and Alternative 3 (Alternate Timber Haul Route)*

***Incremental Effects of Project Related Greenhouse Gases and Carbon Storage*:**

Carbon emissions resulting from the proposed action would total 9,900 tonnes. Current global emissions of carbon dioxide total 25 billion tonnes of carbon dioxide (IPCC 2007, p. 513), and current U.S. emissions of carbon dioxide total 6 billion tonnes (EPA 2007, p 2-3). Therefore, the emissions from the proposed action would constitute .0000004 percent of current global emissions and .0000016 percent of current U.S. emissions.

Tree growth following harvest would offset greenhouse gases and result in net storage of 2,900 tonnes of carbon. The WOPR EIS (p. 4-538), which is incorporated here by reference, states that by 2106, the No Action Alternative (management under the 1995 RMP) would result in a total carbon storage of approximately 628 million tonnes, 9 percent higher than average historic conditions (576 million tonnes, WOPR, 3-224, as reanalyzed in November 6, 2009 memo, on file, Marys Peak Resource Area). The incremental effect of the proposed action, over time, would be net storage of carbon.

4.3 **Soils**

(IDT Reports incorporated by reference: Upper and Lower Alsea River Watershed Restoration Timber Sale Soils Report, pp. 1 to 8)

The analysis indicates that the proposed project is considered unlikely to have detectable affects on soil erosion, or soil productivity. There would be no measurable cumulative impact to the soils resource outside the project area.

Constructing 3 miles of new spur roads would result in loss of top soil and compaction of sub-soil on approximately 12 acres (about 1.4 percent of the total project area). The area currently is forested land that would be converted to non-forest. The roads to be constructed are on gentle topography so the total width of the clearing would be around 20 feet. This narrow clearing would have a very minimal effect of the overall tree spacing and stocking. All of the new construction would be decommissioned and blocked to vehicle traffic following harvest, so some recovery back to a forested condition would occur in this area over time.

Spot road improvement of 30 miles of existing roads would result in no change in amount of current non-forest land. Some encroaching vegetation along these older roads would be removed (hazard tree removal) and surface rock would be added where needed. The improvements would provide better drainage and road surface conditions resulting in less road surface erosion into the surrounding area or streams. The improvement work is expected to result in some minor short term roadside erosion where established vegetation in the ditch and culvert catchment areas are removed during the cleaning and reshaping or culvert and cross drain installment operations. Litter fall accumulations and growth of vegetation generally re-establishes within two seasons and erosion rates return to near natural levels thereafter. In addition, the extra cross drain culverts and the road surface reshaping would reduce the volume of water flowing on the road surfaces and should result in less future erosion.

Some of the proposed harvest areas include remnant skid trails from previous logging in the late 1930 to 1940 period. Where practical, portions of these existing trails would be reused for skid trails on these projects. Following completion of this proposed action, the majority of the understory vegetation and root systems would remain, along with surface soil litter and slash from the harvested trees. Expected additional amounts of surface soil displacement, surface erosion and dry ravel resulting from harvest operations should be minimal. Additional soil compaction can be expected to result from this project. Approximately 46.9 acres in landings, 10.9 acres in skid trails, and 10.8 acres in skyline corridors would be needed. This would result in a cumulative detrimental disturbance level of 8.3 percent of the entire project area for all the project impacts. The aerial extent and degree of disturbance would remain within accepted RMP guidelines of less than 10 percent disturbance.

4.4 Water

(IDT Reports incorporated by reference: Upper and Lower Alsea River Watershed Restoration Hydrology Environmental Assessment pp.1 to 9)

Watershed Hydrology:

Streamflows

For Project 1 activities, approximately 8 percent of the harvest activities in the North Fork Overlook project area (15 acres), and 8 percent of the harvest activities in the Buck Roberts project area (25 acres) lies within the potential rain on snow (ROS) zone. This equates to a very low risk for these events to occur. For Project 2 activities, none of the proposed harvest is located in the potential ROS zone which also equates to a very low risk for these events to occur.

Peak Flows

A rigorous analysis of peak flow potential for both rain-dominated and rain-on-snow dominated 6th field watersheds in the Project 1 and 2 areas was completed in the FEIS 2008. This analysis is located on pages 753-759 of Volume II and also in Appendix I of Volume III of the FEIS. The analysis included the existing condition and proposed timber harvest in a ten year planning period. Private land harvesting was also projected and included in the analysis.

None of the watersheds included in this proposal (or in the entire Alsea River Watershed) were identified as being susceptible to changes in peak flow properties from harvesting activities. The level of proposed harvest activity analyzed in the 2008 FEIS was greater than the levels proposed in these two projects, so it is assumed that there would also be no cumulative impacts to peak flow other than those analyzed in the 2008 FEIS, in the project watersheds, the Upper Alsea River Watershed or the entire Alsea River Watershed from this proposal.

Using information based on a recent report by Grant (2008), an analysis was completed that totaled up the existing amount of harvested lands in the 6th field watersheds in the project areas. This includes the North Fork Alsea River Watershed and South Fork Alsea River Watershed for all land ownerships. That analysis found that approximately 10.4 percent of the North Fork Alsea River Watershed was in a "open" condition, meaning that the lands were either harvested and currently had less than 30 percent crown cover or were naturally open (meadows, rock slopes, etc).

An analysis was also completed that totaled up the existing amount of lands in the South Fork of the Alsea River Watershed for all land ownerships. That analysis found that approximately 10 percent of the watershed was in a "open" condition, meaning that the lands were either harvested and currently had less than 30 percent crown cover or were naturally open (meadows, rock slopes, etc).

The Grant paper set the peakflow detection level at 10 percent based on measurement error in natural stream systems and natural variability in stream systems. Adding in the proposed harvest acres in the South Fork Alsea River watershed; 202 acres in Buck Roberts and 306 acres in Bummer Ridge, the projected percent of the watersheds in an open condition increases to 11.3 percent which would roughly relate to a mean predicted increase of one percent in peak flows. The range does extend up to 4 percent based on the regression line data shown in the envelope curve developed by Grant. For the North Fork Alsea River the percent of the watershed in an open condition increases to 13.1 percent

which would roughly relate to a mean predicted increase of one percent in peakflows. The range does extend up to four percent based on the regression line data shown in the envelope curve developed by Grant.

The analysis assumes no recovery of past harvest stands, the proposed Upper and Lower Alsea River, Yamaha and part of the Mainline harvest activity in the Upper South Fork Alsea River Watershed. It would also assume that the current level of harvest activity on private lands remains the same and that all the acres in the sale are resulting in less than 30 percent crown cover when completed. Based on these side boards, it is still expected that the addition of these proposed harvest activities in both watersheds would fall into the unmeasurable level for peak flow increases based on the Grant envelope curve and the peakflow detection level.

The SPZ widths along all streams in both projects would maintain a minimum of 80 percent shade for the streams. Because stream shading would be maintained, there are no anticipated changes to stream temperature from the implementation of these projects.

The 768 acres of density management are all located in the Upper Alsea River Watershed and equate to less than 1 percent of the lands in the upper watershed and less than 0.5 percent of the entire Alsea River Watershed.

4.5 **Fisheries/Aquatic Habitat**

(IDT Reports incorporated by reference : Upper and Lower Alsea River Watershed Restoration Regeneration Project Environmental Assessment Fisheries pp 1 to 16)

The proposed stand treatments are not expected to alter (LWD) recruitment, stream bank stability, and sediment supply to channels at the 5th field watershed scale in the short-term or long-term. As short-term LWD recruitment is protected and long-term LWD recruitment is enhanced, only slightly positive cumulative effects are anticipated for instream structure from the proposed actions.

Cumulative impacts to fishery resources could occur if proposed actions result in alterations in runoff contributing to changes in flows where fish reside. Based on the Hydrology reports analysis of alterations to peak flows in the project area (Wegner 2009), changes in flows were considered unmeasurable at the site level and are unlikely to contribute to cumulative effects, subsequently, no cumulative effects are anticipated on aquatic resources.

The Hydrology report indicated that the proposed treatments were considered unlikely to have detectable affects on stream temperatures and not expected to result in any cumulative effects to temperature (Wegner 2009). No cumulative effects are anticipated for peak flows, streambanks, and instream structure which could also affect temperature. As no cumulative effects were anticipated for these project activities on temperature, streambank conditions, and peak flows, these treatments would not result in cumulative effects for fisheries resources.

Approximately 54 percent of the land base within the Upper Alsea River Watershed is federally managed, by the BLM and Forest Service. The trend in LWD recruitment on federal lands is increasing as the stands mature within the Northwest Forest Plan designated Riparian Reserves (Reeves et al 2006). Analysis conducted under the 2008 FEIS indicated trends of LWD recruitment on all Western Oregon and Washington BLM managed Riparian Management Areas.

Private lands account for roughly 46 percent of the land base in the Upper Alsea River Watershed. An assessment of Oregon Forest Practices indicated on non-federally managed forest lands, roughly 94 percent of the riparian network would be considered inadequately stocked for future recruitment of LWD (IMST 1999). However, based on the various policies currently being applied to coastal Oregon forest lands, the amount of riparian area with large and very large conifer trees, which would contribute towards large wood recruitment, is projected to increase significantly (Spies et al 2007).

The BLM, industrial forest companies, and small land owners have conducted a variety of site level LWD enhancement projects in the Upper Alsea River Watershed in Tobe Creek, Peak Creek, and the Upper South Fork Alsea River. Future LWD enhancement work is planned in the South Fork Alsea River, Trout Creek, Peak Creek, Bummer Creek, and Fall Creek by the Alsea River Watershed Council, Mid-Coast Watershed Council, Forest Service, and BLM. Site level LWD restoration projects, both private and public, have locally increased LWD abundance. However, these projects are unlikely to detectably alter fish productivity at 5th field scale due to the small scale of project work and lack of connectivity between treatment areas.

Proposed road renovation activities associated with the mid-seral enhancement are unlikely to reach fish habitat and would not be expected to contribute to any cumulative effects. Hauling and culvert replacement may contribute a minor amount of sediment to the stream network in the wet season. Most haul routes are located near ridge tops with a limited number of stream crossings. Hauling and culvert replacement within the effected drainages are in close proximity to fish habitat; however, site level impacts were expected to be unmeasurable. As site level impacts are anticipated to be unmeasurable, cumulative effects to aquatic resources would be unmeasurable.

Extensive road work has occurred on BLM, USFS and adjacent industrial forest over the last decade in the Upper and Lower Alsea River Watersheds. In addition to timber sale road construction, substantial restoration work has occurred to improve road stability, reduce road generated sedimentation, and remove barriers to aquatic habitat movement at stream crossings. Site level road work, both private and public, have had negative and positive impacts on aquatic habitat. However, these projects are unlikely to detectably alter fish productivity at 5th field scale due to the small scale of project work and lack of connectivity between treatment areas.

Impacts of other hauling activities, from Forest Service and private forests, may contribute to cumulative impacts to fish habitat at the 5th field scale. However, the magnitude and extent of impacts from hauling are impractical to assess, or predict, due to high degree of variability of hauling which may occur within a watershed from one year to the next.

4.6 **Wildlife**

(IDT Reports incorporated by reference: Biological Evaluation pp. 9 to 10)

With the current rate of harvest on private lands (estimated to be 40- to 50-year rotations), about 20 percent to 25 percent of the private mid-seral forests in these watersheds are expected to be harvested over the next decade. This private harvest will likely be balanced by the in-growth of a similar percentage of early-seral forest stands transitioning to mid-seral forest over the next decade.

In addition to the proposed thinning harvest of 768 acres (Project 1), BLM has previously thinned (since 1995) about 2,495 acres of mid-seral forests and has planned about 1,710 acres of foreseeable future thinning (next five years) within the Upper and Lower Alsea River watersheds (see Table 18). These past, proposed, and foreseeable future thinning harvests, which span a 20 year period, would

alter about 24 percent of the available mid-seral forests on BLM-managed lands (20,400 acres) within these watersheds. This level of thinning harvest (about 1.2 percent per year) does not result in a loss of mid-seral forest function or connectivity across these watersheds, and it would not contribute to the need to list any wildlife species that utilize mid-seral forest habitats. Due to the very small amount of proposed conifer release (Project 2) and relatively few acres of past and future planned activity (see Table 18) there would be no cumulative negative effects to existing hardwood forest habitats within these watersheds. Collectively, both Project 1 and 2 would contribute to the cumulative beneficial enhancement of the mid-seral forest structure and hardwood stand diversity on BLM-managed lands within these watersheds.

Table 18. Summary of Proposed, Past, and Foreseeable Harvest Acreage on BLM lands.

	Upper Alsea Watershed	Lower Alsea Watershed	Total Area
Baseline Data			
Total Watershed Acres	81,300	99,800	181,100
BLM-managed lands in Watershed	43,040	12,900	55,940
Proposed Action			
Project 1 – Density Management	768	0	768
Project 2 – Conifer Release	17	24	41
Past Actions on BLM [1]			
Density Management Thinning	1,130	0	1,130
Commercial Thinning	1,365	0	1,365
Conifer Release in Hardwoods	16	5	21
Foreseeable Future Actions on BLM [2]			
Density Management Thinning	520	200	720
Commercial Thinning	990	0	990
Conifer Release in Hardwoods	0	0	0

1). Past Actions occurring on BLM-managed lands within each watershed since 1995 (beginning of Northwest Forest Plan implementation).

2). Foreseeable future actions on BLM-managed lands within each watershed for the next five years (current planning horizon).

Within the northern Oregon Coast Range, the condition of dispersal habitat for spotted owls is a matter of elevated concern (Courtney et al. 2004, USDI-FWS 2008a). The Project 1 units, which would thin about 140 acres in OMOCA-36 and 329 acres in OMOCA-39, would not contribute to any cumulative loss of dispersal habitat since the functional capacity as dispersal habitat would be maintained. There would be no cumulative effects to marbled murrelets since no suitable habitat would be modified, and there would be no cumulative effects to red tree voles since no older forest habitats (which best support population persistence) would be affected.

4.7 **Fuels/Air Quality**

(IDT Reports incorporated by reference: Upper and Lower Alsea River Watershed Restoration Fuels Report, pp. 1 to 7)

There would be few cumulative effects to the resources, as the effects from the project would be local and / or short lived, and there would be no other uses affecting this resource. Burning of slash would be guided by the OSMP which serves to coordinate all forest burning activities on a regional scale to protect local and regional air sheds. Based on past experience with pile burning in this and other similar areas there are no expected cumulative effects on regional air quality from the planned fuels treatment under this proposal.

In the treated areas there would be a moderate increase in fuel loading and resultant fire hazard in the short term, but that would diminish within a few years. When looked at from a watershed scale, the selected harvest on approximately 810 acres of forest habitat would result in a very minor increase during the first 10 years following treatment, in risk of a fire start and resistance to control a fire overall for the watershed. Longer term (10 to 50+ years) there would be a reduction in the potential of the treated stands to carry a crown fire. Fire risk along roads and landings would diminish by a substantial margin as soon as piles and concentrations are burned or the fuels are removed from the site for cogen power production or other uses.

4.8 **Recreation/Visual**

(IDT Reports incorporated by reference: Recreation/Rural Interface/VRM Report pp. 1 to 5)

Timber harvest would interrupt recreation activities for approximately three to five years and is expected to return to prior usage. Additional road closures may occur upon completion of harvest activities. Motorized dispersed recreation in the area has declined with each gate installation. This project would have minimal to no impact on recreational uses due to the fact there are other opportunities available.

Residential development along haul routes routinely receives log truck traffic from timber management activities on private and public lands.

Looking at aerial photos it is evident that timber management has occurred for many years and would continue to occur in the viewshed, both thinning and regeneration harvest activities. Timber management activities would continue to result in temporary changes to visual resources while logging debris and crushed undergrowth vegetation dies turning brown to red. If logging debris piles are burned blackened areas would be visible until vegetation growth covers the scars. Smoke would dissipate. Vegetation would green up and return within five years, leaving the units less noticeable from roads and residences.

5.0 COMPLIANCE WITH THE AQUATIC CONSERVATION STRATEGY

Existing Watershed Condition

The Revised Upper and Lower Alsea River Watershed Restoration Project area is in the Upper Alsea River and Lower Alsea River 5th-field Watersheds which drain into the Alsea River. Fifty-two percent of the Upper Alsea River Watershed is managed by BLM, 47 percent is private and 1 percent is managed by the Forest Service. Approximately 37 percent of the total BLM managed lands consist of stands greater than 80 years old; and approximately 27 percent of BLM-managed lands are located in riparian areas (within 100 feet of a stream). Forty-two percent of the Lower Alsea River Watershed is managed by U. S. Forest Service, forty-five percent is managed by private, and thirteen percent is managed by BLM. Approximately 46 percent of the total BLM managed lands consist of stands greater than 80 years old.

Review of Aquatic Conservation Strategy Compliance:

The following is an update of how these projects comply with the four components of the Aquatic Conservation Strategy. The projects would comply as follows:

Component 1 – Riparian Reserves: The Revised Upper and Lower Alsea River Watershed Restoration projects would comply by maintaining canopy cover along all streams and wetlands which protect stream bank stability and water temperature. Stream protection zones (SPZ) would protect streams from direct disturbance from logging. Riparian Reserve boundaries would be established consistent with direction from the RMP. No new road construction would occur within the RR LUA.

Component 2 – Key Watershed: by establishing that the project is within the Tobe Creek Key Watershed.

Component 3 –Watershed Analysis:

The *South Fork Alsea River Watershed Analysis* (1995) describes the events that contributed to the current condition such as early hunting/gathering by aboriginal inhabitants, road building, agriculture, wildfire, and timber harvest. The following are watershed analysis findings that apply to or are components of these projects:

- Density management opportunities in LSRs should focus at improving the corridor of dispersal habitat in the Middle South Fork Alsea River, Upper South Fork Alsea River, and Peak Creek subwatersheds, since existing Late Successional/Old Growth habitat in this area is highly fragmented. The Revised Upper and Lower Alsea River Watershed Restoration DMS Project is located within the Peak Creek subwatershed (p. 44).

The *Lower Alsea River Watershed Analysis* (1999) 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.

- **Stand Maintenance and Release**
  Purpose: To provide sufficient light and growing space for growing conifer seedlings.
  Criteria for identification of projects:
    1) Select units where hardwoods overtop conifers or where competing brush or conifers threatens the survival or decreases the growth of preferred conifer seedlings.
    2) Select stands 3-15 years of age for best results.
    3) Treat between June and August for most effective treatment.
    4) Treat before conifer growth has slowed significantly from competition (pg. 120).

Component 4 – Watershed Restoration:

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

Table 19: Consistency with the Nine Aquatic Conservation Strategy Objectives

Aquatic Conservation Strategy Objectives (ACSOs)	Mid Seral Enhancement and Conifer Release Projects
1. Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted..	Does not prevent the attainment of ***ACSO 1***. **No Action Alternative:** The No Action alternative would maintain the development of the existing vegetation and associated stand structure at its present rate. The current distribution, diversity and complexity of watershed and landscape-scale features would be maintained. Faster restoration of distribution, diversity, and complexity of watershed and landscape features would not occur. **Action Alternative:** Treatment includes variable density thinning, creation of small gaps around "open grown" trees, and retention of small clumps. This would increase spatial and structural diversity of the stand. Species diversity would be increased, as thinning would target Douglas-fir, increasing the relative proportion of the other tree species. Furthermore, treatment would promote the establishment of seedlings, which are likely to include hardwood, western hemlock and western red cedar (EA.p. 56). The direct and indirect changes anticipated to occur to forest habitat characteristics from the planned units are: Light to moderate reduction of canopy closure, increased horizontal spatial variability, reduced recruitment rate of small sized CWD would be partially offset by immediate creation of larger CWD of desirable size, and augmentation of decadence processes; retention of hardwood tree and shrub diversity (EA.pg. 64).
2. Maintain and restore spatial and temporal connectivity within and between watersheds.	Does not prevent the attainment of ***ACSO 2***. **No Action Alternative:** The No Action alternative would have little effect on connectivity except in the long term within the affected watershed. **Action Alternative:** Long term connectivity of terrestrial watershed features would be improved by enhancing conditions for stand structure development. In time, the Riparian Reserve LUA would improve in functioning as refugia for late successional, aquatic and riparian associated and dependent species. Both terrestrial and aquatic connectivity would be maintained, and over the long-term, as the Riparian Reserve LUA develops late successional characteristics, lateral, longitudinal and drainage connectivity would be restored.. No stream crossing culverts would be used that would potentially hinder movement of aquatic species; therefore no aquatic barriers would be created. Both terrestrial and aquatic connectivity would be maintained, and over the long-term, as Riparian Reserves develop late successional characteristics, lateral, longitudinal and drainage connectivity would be restored. Renovation of the transportation system would not affect spatial connectivity.
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***. **No Action Alternative:** It is assumed that the current condition of physical integrity would be maintained. **Action Alternatives:** Projects 1 and 2 are unlikely to affect stream channel stability and function as all field identified streams and wet areas would be protected with a minimum 55-foot SPZ. No yarding would occur across streams. No bank stabilizing vegetation would be removed. Project 2 (Units 19D and 7D) would be removing large red alder trees that could potentially become LWD in the stream. However, thinning is proposed to produce larger conifer trees over time that would be available to fall into the stream adding longer lasting structure and complexity to the channel. (EA p. 78).

Aquatic Conservation Strategy Objectives (ACSOs)	Mid Seral Enhancement and Conifer Release Projects
4. Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems.	Does not prevent the attainment of ***ACSO 4***. **No Action Alternative:** It is assumed that the current condition of the water quality would be maintained. **Action Alternative:** Streams in the North Fork Overlook project area are classified by the North Fork Alsea River Watershed Analysis as having a "low" risk of detrimental changes in water temperature based on stream bank vegetation shading (Map Plate 10, USDI 1996). There is one small section of stream identified near Unit 17B that is classified as having a high risk for changes in stream temperature if stream bank vegetation was removed. This entire stream has a 300 foot buffer (each side) proposed, so no change in stream temperature is expected. Based on field observations, aerial photo reviews of streams completed for the analysis of this EA between 2004 and 2006, and modeling runs for the project area, current streamside vegetation and valley topography appears adequate to shade surface waters during summer base flow and it is likely that stream temperatures consistently meet the Oregon state standard (18 degrees Celsius) for these waters (EA p. 76). According to the stream shading sufficiency analysis done for the proposed treatment units, the proposed SPZ of 55 feet was sufficient to protect critical shade in the primary shade zone within unit 19D and 7D, based on topography and average tree height (Snook 2009). The proposed vegetation treatment in the secondary shade zone (approximately one tree height from the stream) would not result in canopy reduction of more than 68 percent. Protection of stream shading thru application of SPZs and silviculture prescriptions retaining adequate canopy cover would be expected to maintain the existing stream temperature (Wegner 2009) EA p 84.. Sedimentation and stream turbidity: see No. 5 below
5. Maintain and restore the sediment regime under which aquatic ecosystems evolved.	Does not prevent the attainment of ***ACSO 5***. **No Action Alternative:** It is assumed that the current levels of sediment into streams would be maintained. **Action Alternative:** The existing condition of areas indicates there are no sign of mass wasting on BLM managed lands. Considering the harvest type (cable or aerial), the existing road locations above and below the proposed units, and the small size of the steeper portions of the units, it is not anticipated that the thinning harvest activity would trigger any mass wasting or slumping in the project areas. Therefore, increases in sediment delivery to streams due to mass wasting are unlikely to result from this action (EA p. 76). In the less steep portions of the project areas, the SPZ's in riparian areas have high surface roughness, which would function to trap any overland flow and sediment before it could reach any streams. In order to minimize soil compaction and erosion, ground-based skidding would occur during periods of low soil moisture with little or no rainfall,. Aerial and skyline yarding are not projected to increase sediment production in the project areas (EA p 76). Road renovation practices are intended to reduce or eliminate the deposition of road fill material into adjacent streams. (EA p. 89).

Aquatic Conservation Strategy Objectives (ACSOs)	Mid Seral Enhancement and Conifer Release Projects
6. Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing.	Does not prevent the attainment of ***ACSO 6***. **No Action Alternative:** No change in in-streams flows would be anticipated. **Action Alternative:** Project 1 and Project 2 both include timber harvesting activities and have been analyzed together since increases in mean annual water yield following the removal of watershed vegetation have been documented in numerous studies around the world (Bosch et al., 1982). Measurable increases (greater than 10 percent) in water yield would be expected to last approximately 20 to 30 years based on the above cited studies. Vegetation would intercept and evapotranspire precipitation that would otherwise become runoff. Thus, it can be assumed that the actions considered under this proposal would likely result in some small increase in water yield (including a small increase in summer base flow) which correlates with the removal of a portion of the conifer overstory in the watershed. Based on the amount of harvest in this proposal, the level of water yield increase would be well below 10 percent and would not be able to be detected from the natural range in variability in flow levels on a year to year basis.(EA pp. 75 to 76)..
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***. **No Action Alternative:** No change in in-streams flows would be anticipated. **Action Alternative:** Design features for both projects, such as no-treatment SPZ's, coupled with the relatively small percent of vegetation proposed to be removed, would maintain groundwater levels and floodplain inundation rates. Detectable direct or indirect effects to stream flow as a result of this action are unlikely. The proposed actions would not alter existing patterns of floodplain inundation or water table elevation as it would have no effects on existing flow patterns and stream channel conditions. Proper drainage of roads would maintain water tables and flood plain functions.
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***. **No Action Alternative:** The current species composition and structural diversity of plant communities would continue along the current trajectory. Diversification would occur over a longer period of time. **Action Alternative:** From research on the BLM Western Oregon Density Management Study (Chan et al), thinning affects vegetation structure by increasing cover of grasses and forbs and increasing species richness, a measure of diversity. Richness increased because forest floor herb species typically found under forest canopies remained and flourished, and were joined by open-site herbs and grasses not typically found under forest canopies. However, species composition and abundance following thinning is more dependent on composition and abundance prior to treatment than on treatment effects. In the six year period following treatment, plant communities transitioned from an increased cover of species associated with open sites and early seral stages, to a greater proportion of shade-tolerant forest floor species. For example, cover of grasses and early seral forbs was greatest one year following treatment, and were decreased six years after treatment. Since thinning occurred in riparian reserves within 20 to 50 feet from streams in the sampled areas, these results are applicable to riparian areas and would support thinning to maintain species composition and structural diversity of plant communities (EA p. 55).

Aquatic Conservation Strategy Objectives (ACSOs)	Mid Seral Enhancement and Conifer Release Projects
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***. **No Action Alternative:** Habitats would be maintained over the short-term and continue to develop over the long-term with no known impacts on species currently present. **Action Alternatives** Research has found that thinning treatments generally maintained habitat for native plant, invertebrate and invertebrate riparian-dependant species. Specifically, thinning was found to increase species richness of arthropods, and forest riparian buffers thirty meters wide serve as refuge for both forest-upland and forest-riparian arthropod species. Thinning was found to have minimal effects on most species of aquatic vertebrates including salamanders. Native plants were found to persist and increase in coverage after density management. Patch openings and wide thinning drastically reduced the diversity of epigeous ectomycorrhizal fungal species, but medium and high retention thinning showed little change in fungal diversity. Buffers of widths defined by the transition from riparian to upland vegetation or topographic slope breaks appear sufficient to mitigate the impacts of upslope thinning on the microclimate above headwater streams. Because the microclimate, as well as the structure and composition of the forest stand and understory vegetation are protected within the untreated buffer, habitat elements seem to be protected (EA p. 55 and 56).

6.0 LIST OF PREPARERS

Table 20: List of Preparers

Resource	Name	Initial	Date
Cultural Resources	Heather Ulrich	HJU	04/05/10
Hydrology/Water Quality/Soils	Steve Wegner	SJW	4/1/10
Silviculture/Riparian Ecology	Hugh Snook	HWS	3/31/10
Botany Special Status Plant and Fungi Species	Ron Exeter	RE	March 31, 2010
Wildlife Special Status Animal Species	Scott Hopkins	SH	3/31/10
Fuels/Air Quality	Terri Brown		
NEPA Review	Gary Humbard	GLH	3/31/10
Fisheries	Scott Snedaker	SWS	4/2/10
Recreation/VRM/Rural Interface	Traci Meredith	TMM	4/1/2010
Road Work	Steve Cyrus	SC	3/31/2010
Timber Harvest Planning	Andy Frazier/Cory Geisler	AJF CG	3/31/2010 3/31/2010

7.0 CONTACTS AND CONSULTATION

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

U. S. Fish and Wildlife Service (USFWS)
To address concerns for potential effects to listed wildlife species and potential modification of critical habitats, the proposed action was consulted upon with the USFWS, as required under Section 7 of the Endangered Species Act. Consultation was addressed by inclusion of the proposed action units within either of two batched Biological Assessments (BAs) that analyze all projects that may modify the habitat of listed wildlife species on federal lands within the Northern Oregon Coast Range during fiscal years 2009 and 2010. Project 1 and 2 treatments have been designed to incorporate all appropriate design standards included in these BAs. A Letter of Concurrence (#13420-2008-I-0125) and a Biological Opinion (#13420-2009-F-0012) have been received from the Service and they do not require any changes or additions to the incorporated project design standards. The Biological Opinion also concludes that the proposed action would not result in jeopardy to listed species and would not adversely modify critical habitat for either the spotted owl or marbled murrelet.

National Marine Fisheries Service
The proposed thinning actions associated with portions of Project 1 activities (Bummer Ridge Timber sale, Buck Robert Timber sale, and North Fork Overlook Timber sale) and all of Project 2 activities are within 0.5 miles to the listed fish or listed critical habitat in the Lower South Fork Alsea River, Crooked Creek, North Fork Alsea River, and Fall Creek Sub-Watersheds. Proposed hauling associated with the project areas in the Lower South Fork Alsea River and Fall Creek Sub-Watersheds occur adjacent to listed fish. A determination has been made that these proposed project items would be a 'May Affect' on OC coho salmon. The 'May Affect' determination is based on the proximity of the density management treatments and hauling to the Lower South Fork Alsea River, Crooked Creek, Upper North Fork Alsea River, and Fall Creek Sub-Watersheds where listed fish reside. Due to the "May Affect" determination these portions of the project would need to have consultation completed with the NMFS prior to implementation.

Compliance of the Density Management portions of the project activities with guidance described in *Endangered Species Act Section 7 Informal Consultation for the 2008-2009 North Coast Province Thinning Timber Sales Programmatic on Portions of the Siuslaw National Forest and Eugene and Salem Districts of the Bureau of Land Management, Seven Watersheds within the Oregon Coast Recovery Domain* (NMFS 2008) would provide consultation coverage for the May Affect actions. Actions which do not comply with design criteria of the Thinning Timber sale Programmatic or Aquatic Restoration Biological Opinion (ESA 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, CY2007-2012) would require additional ESA consultation coverage.

Protection of EFH as described by the Magnuson/Stevens Fisheries Conservation and Management Act and consultation with NMFS is required for all projects which may adversely affect EFH of Chinook and coho salmon. The treatment project areas vary between 50 feet and over 0.5 miles from nearest habitat utilized by coho salmon (Streamnet 2007). The nearest unpaved stream crossing on the haul route is adjacent to coho salmon habitat and approximately 4 miles of the Fall Creek Road parallels

and is less than 500 feet from EFH. All proposed haul routes adjacent to EFH would be seasonally restricted to dry conditions. The proposed Projects 1 and 2 are not expected to adversely affect EFH. The determination is based on distance of vegetation treatment activities from occupied habitat and the dry season of use for hauling on unpaved roads in the Upper and Lower Alsea River Watersheds. Consultation with NMFS on EFH is not required for these projects.

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

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

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

For information on project scoping and the original EA comment period, see EA section 1.5.

The revised EA and FONASI will be made available for public review from April 4, 2010 to April 19, 2010 and posted at the Salem District website at http://www.blm.gov/or/districts/salem/plans/index.php. The notice for public comment will be published in a legal notice in the *Gazette Times* newspaper. Written comments should be addressed to Trish Wilson, Field Manager, Marys Peak Resource Area, 1717 Fabry Road S., Salem, Oregon 97306. Emailed comments may be sent to OR_Salem_Mail@blm.gov.

8.0 MAJOR SOURCES AND COMMON ACRONYMS

8.1 Major Sources

8.1.1 Interdisciplinary Team Reports:

Exeter, R. 2010. Revised Botanical Report. Marys Peak Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Hopkins, S. 2010. Revised Biological Evaluation **(**Revised Upper and Lower Alsea River Watershed Restoration Projects) . Marys Peak Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Meredith, T. 2010. Revised Upper and Lower Alsea River Watershed Restoration Recreation/Rural Interface/VRM Report. Marys Peak Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Snedaker, S. 2010. Revised Upper and Lower Alsea River Watershed Restoration Environmental Assessement Fisheries. Marys Peak Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Snook, H. 2010 Revised Upper and Lower Alsea River Watershed Restoration EA Silviculture Abstract, Marys Peak Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Tomczyk, T. 2010. Revised Upper Lower Alsea River Watershed Restoration Fuels Report. Marys Peak Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Wegner, S. 2010. Revised Upper and Lower Alsea River Watershed Report for Hydrology and Soils. Marys Peak Resource Area, Salem District, Bureau of Land Management. Salem, OR.

8.1.2 **Additional References:**

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.

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.

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

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

USDA Forest Service and USDI Bureau of Land Management. 2007. Biological Assessment, Fiscal year 2009/2010 habitat modification activities in the North Coast Province which might affect bald eagles, northern spotted owls or marbled murrelets.

USDI. Bureau of Land Management. 2008. Salem District Record of Decision and Resource Management Plan. Salem, OR.

USDI. Bureau of Land Management. 2008. Salem District Proposed Resource Management Plan/Final Environmental Impact Statement. Salem, OR.

Endangered Species Act Section 7 Informal Consultation for the 2008-2009 North Coast Province Thinning Timber Sales Programmatic on Portions of the Siuslaw National Forest and Eugene and Salem Districts of the Bureau of Land Management, Seven Watersheds within the Oregon Coast Recovery Domain

Biological Assessment of Habitat Modification Projects Proposed During Fiscal Years 2009 and 2010 in the North Coast Planning Province, Oregon, that are Likely to Adversely Affect (LAA) Northern Spotted Owls or Marbled Murrelets and Their Critical Habitats

Biological Assessment of Habitat Modification Projects Proposed During Fiscal Years 2009 and 2010 in the North Coast Planning Province, Oregon, That Are Not Likely to Adversely Affect (NLAA) Northern Spotted Owls or Marbled Murrelets and Their Critical Habitats

Letter of Concurrence on the Effects of Habitat Modification Activities on the Northern Spotted Owl (*Strix occidentalis caurina*), Marbled Murrelet (*Brachyramphus marmoratus*), and Critical Habitat in the North Coast Planning Province, FY 2009 – 2010, proposed by the Eugene District, Bureau of Land Management; Salem District, Bureau of Land Management; and the Siuslaw National Forest (FWS Reference Number 13420-2008-I-0125)

Biological Opinion Regarding the Effects of Habitat Modification Activities within the North Coast Province, FY 2009-2010, proposed by the Eugene District, Bureau of Land Management; Salem District, Bureau of Land Management; Siuslaw National Forest on the Northern Spotted Owl (*Strix occidentalis caurina*), Marbled Murrelet (*Brachyramphus marmoratus*), and their Critical Habitats (FWS Reference Number 13420-2009-F-0012)

Crookston, Nicholas L. 1997. Suppose: An Interface to the Forest Vegetation Simulator. In: Teck, Richard; Moeur, Melinda; Adams, Judy. 1997. Proceedings: Forest Vegetation Simulator Conference. 1997. February 3-7, Fort Collins, CO. Gen. Tech. Rep. INT-GTR-373. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station.

(was IPCC 2007) Denman, K.L., et al. 2007: Couplings Between Changes in the Climate System and Biogeochemistry. In: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M.Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-chapter7.pdf

Forster, P, et al. 2007. Climate Change 2007: The Physical Science Basis. Contribution of Working Group 1 to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Solomon, S. D., Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller, Eds. Cambridge University Press, U.K. and New York, N.Y. ***(pp. 129-234).*** http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-chapter2.pdf

Hudiburg, T. Law, B. Turner, D. Campbel, J. Danato, D. and Duane, M. 2009. Carbon dynamics of Oregon and Northern California forests and potential land-based carbon storage. Ecological Applications, 2009: 163-180.

Smith, J.E. Heath L.S. Skog, K.E., and Birdsey, R.A. 2006. Methods for calculating forest ecosystem and harvested carbon with standard estimates for forest types in the United States. Gen. Tech. Rep. NE-343. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northeastern Research Station. 216 p. http://www.treesearch.fs.fed.us/pubs/22954

(was U.S. EPA 2007) U.S. EPA Environmental Protection Agency. 2009. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2007. U.S. EPA, Washington, D.C. http://www.epa.gov/climatechange/emissions/usinventoryreport.html

Lehmkuhl, John F, 2002, The effects of spring burning and grass seeding in forest clearcuts on native plants and conifer seedlings in coastal Washington. Northwest science 2002, vol. 76, no.1, pp. 46-60 [15 page(s) Washington State University, Pullman, WA

Zamora, Benjamin A., 1981. In: Proceedings, forest succession and stand development research in the Northwest, Means, Joseph E., Editor. Proceedings of symposium, March 26, 1981, Corvallis, OR. Forest Research Laboratory, Oregon State University

9.0 APPENDICES

9.1 Appendix A - Response to Scoping Comments

A scoping letter, dated August 28, 2008, was sent to 22 potentially affected and/or interested individuals, groups, and agencies. Two responses were received during the scoping period.

9.1.1 Summary of comments and BLM responses

The following addresses comments raised in two letters 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.

9.1.1.1 *Oregon Wild (September24, 2008)*

1. **Comment:** *Although temporary roads cause less impact, temporary roads still channelize water, cause erosion and conduct invasive weeds. Oregon Wild believes it is possible to conduct thinning without extensive new road construction. Some weed introduction and soil disturbance can be off-set by the thinning operation,, however, extensive road construction is not justified by a small restoration project.*

Response: During project planning, the Revised Upper and Lower Alsea River Watershed Restoration IDT strived to minimize new road construction on these projects. Harvest reconnaissance indicates approximately 3 miles of new road construction would be necessary for operability due to topography constraints present in the project areas. The majority of new road is located on ridge tops, generally outside riparian reserves, and no new construction would cross any existing stream channels. One alternative that would have required additional road construction than the proposed action was considered but dropped from further analysis (See EA Section 2.4, pg. 28).

Mitigation measures which have been incorporated into this project to keep the amount of exposed mineral soil minimized and the implementation of the Marys Peak integrated non-native plant management plan allows for early detection of non-native plant species which allows for rapid control would reduce the risk of adverse effects to vegetative, hydrologic, aquatic, and soil resources.

2. Comment: *The BLM needs to complete a cost/benefit analysis for each new road to help inform the decision maker in balancing the costs and benefits of thinning and roading. The potential*

benefits of thinning must be weighed against the certain immediate costs of road construction. Even temporary roads degrade the ecosystem for years to come".

Response: Some new road construction is necessary for operability due to topography present in the project area. All new road construction would be blocked to vehicular traffic following harvest and would be located outside RR (generally on ridgetop locations). Best Management Practices would be followed during road construction to reduce the risk of adverse effects to aquatic resources. The project design feature of revegetating exposed soil areas by sowing with Oregon Certified (blue tagged) red fescue (*Festuca rubra*), 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 abate the establishment of noxious weeds.

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

North Fork Overlook

Road #	Primary Road Work	Miles	Associated Unit Acres	Acres of Unit/Mile of Road
P1	New	0.28	118	421
P2	New	0.32	32	100
P3	New	0.05	12	240
P4	New	0.05	15	300

Buck Roberts

Road #	Primary Road Work	Miles	Associated Unit Acres	Acres of Unit/Mile of Road
P1	New	0.04	3.5	88
P2	New	0.04	7	175
P3	New	0.17	19	112
P4	New	0.12	30	250
P5	New	0.31	20	65
P6	New	0.12	5	42
P7	New	0.21	17	81
P8	New	0.24	29	121
P9	New	0.08	9	113

Bummer Ridge

Road #	Primary Road Work	Miles	Associated Unit Acres	Acres of Unit/Mile of Road
P1	New	0.10	8	80
P2	New	0.03	7	233
P3	New	0.12	19	158
P4	New	0.09	11	122
P5	New	0.03	13	433

P6	New	0.09	13	144
P7	New	0.20	18	90
P8	New	0.08	16	200
P9	New	0.03	8	267

3. Comment: *Ground based logging equipment may cause significant soil disturbance that will not be offset by the intended benefits to the vegetation.*

Response: As noted in EA (pp. 75 to 77) "If yarding is done using crawler tractors for the entire ground based area expect moderate to heavy degree of soil compaction and a moderate amount of top soil displacement to occur in skid trails and at landings. If a harvester/forwarder system is used for the entire ground based area very little or no top soil loss or displacement should occur. For harvester/forwarder systems soil impacts in skid trails are expected to result in light to moderate compaction. The trees in the project area have ample crowns, so there should be adequate slash on the ground to yard over. The effect on overall site productivity from light to moderate compaction would result in no expected measurable reduction in overall yield for the project area".

"For tractor yarding plus all landings soil impacts are expected to result in moderate to heavy, fairly continuous compaction within the landing areas and the main 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 acres of landings and skid trails is a 20 percent reduction in yield. The affect on overall project site productivity resulting from the impacted acres is expected to be less than 3 percent reduction in overall yield for the project area".

4. Comment: *Please describe the purpose and need and proposed treatments in the 36-acre hardwood area. What is the history of this area? How will the proposed treatment help develop late-successional habitat? Please consider the need for habitat diversity and the importance of hardwoods for various wildlife species, and incorporate diverse habitat needs into the prescription for the area. In other words, leave some hardwoods in the units in patches mixed in with the areas where conifer enhancement will occur.*

Response: As stated in the EA (Pg. 3) the purpose of Project 2 (Conifer Release) is to promote development of habitat suitable for nesting, roosting, and foraging for the marbled murrelet in stands that do not currently meet nesting habitat criteria (RMP pp. 35 and 36) and to provide for riparian and aquatic conditions that supply stream channels with shade, sediment filtering, leaf litter and large wood, and streambank stability; and enhance or restore habitat [(e.g. coarse woody debris (CWD), snag habitat, instream large wood) for populations of native riparian-dependent plants, invertebrates, and vertebrate species (RMP pp. 38).

5. Comment: *Oregon Wild supports variable density thinning where areas of light, moderate and dense patches are created along with ¼ to ½ acre gaps and dense patches. Please use variable density thinning and protect all remnant older trees and snags.*

Response: We always try to achieve variable density in our LSR treatments and believe that our prescription would accomplish that. We plan to create canopy gaps around "open grown trees" and also to leave small un-thinned areas (clumps). In the North Fork Overlook portion of the project, diameter cut limits would be used to create fine-scale (.1 acre) variation in density. In this method, all trees below a specified diameter are removed, creating variability based on random occurrence of trees of

given diameter. In other portions of the project, fine-scale variability would be created by leaving variable residual basal area, where density is varied by about 50 percent above and below the specified average basal area. We would also reserve all hardwoods in most areas to give us additional spacing variability.

We realize that large diameter snags are important legacy features that should be retained in treatment units, and we understand your concern that safety/operational issues should not diminish these structures. We would purposely design most of our un-thinned clumps to protect one or more snags. Historically it has been our fairly extensive experience that the loss of large diameter snags for operational/safety reasons rarely happens in our thinning units, but is occasionally necessary in close proximity to roads and landings, and within skyline yarding corridors/ground based skid trails.

6. Comment: *Special status species surveys must be completed prior to developing NEPA alternatives and before the decision is determined. On-the-ground field reconnaissance surveys must be done and used to develop NEPA alternatives. Impacts on old-growth species should be discussed in detail in the EA.*

Response: As stated in the EA (pg 20) **"**For botanical bureau SS species (includes state and federal threatened and endangered) whose characteristics make locating them with field surveys practical, clearances would generally be done by field surveys using intuitive controlled methods, field clearances, field reconnaissance, inventories, and/or habitat examinations. Clearances for fungi are considered "not practical" and surveys are not required. Site management of any bureau SS botanical and fungal species found as a result of additional inventories would be accomplished in accordance with 2008 ROD/RMP, Salem District. Specialist survey results are used to formulate alternatives and exclude acreages".

Impacts to listed species in the RA would be included in Appendix A, within the Biological Evaluation of the Upper and Lower Alsea River Restoration project NEPA file.

7. Comment: *A full range of action alternatives should be considered for this project. These alternatives should include projects that lead to wildlife habitat enhancement and restoration, old growth protection (minimum fragmentation), and minimal road construction/reconstruction.*

Response: The proposed action alternative for Projects 1 and 2 would develop mid seral stands toward late-successional forest conditions by accelerating the growth of conifer trees and by restoring habitat (e.g. CWD, snag habitat, in-stream large wood) through variable density thinnings. Approximately 3 miles of temporary new road construction (the majority located on ridgetops and no stream crossings) would be necessary to facilitate harvest activities (See response #1).

Wildlife habitat would be enhanced by creating immediate CWD. A gradual transition in structural characteristics of the treated stands that more closely resemble late-seral forest (larger diameter trees, sub-canopy development, greater tree species diversity, greater volume and size of hard CWD, canopy gaps) would be accomplished. In addition, the extended persistence of hardwood tree and shrub cover diversity would be maintained. No harvesting would occur in late-seral forests and all trees greater than 80 years old would be reserved.

8. Comment: *In Late Successional Management Areas, we only support thinning of young stands if there is no road construction. In young stands in Riparian Management Areas, we support thinning*

activities that enhance the development of trees to shade streams and become sources of coarse woody debris, as long as these activities do not result in yarding corridors, roads, or other yarding activities impacting water quality and aquatic habitat. We encourage you to plan on entering Riparian Management Areas only once.

Response: As stated in response #1, **"**During project planning, the Revised Upper and Lower Alsea River Watershed Restoration IDT strived to minimize new road construction on these projects". As stated in the EA (pg. 91) The proposed vegetation treatment in the secondary shade zone (approximately 210 feet from the stream) would not result in canopy reduction of more than 50 percent. Loss of CWD and large woody debris (LWD) due to harvest can alter the stability and quality of aquatic habitat. Based on the stand analysis, including riparian areas, the proposed action would retain trees which would reach larger diameters earlier compared to the no treatment option, creating natural opportunities for higher quality LWD recruitment in the long-term (Snook 2009). In the short-term the smaller woody debris would continue to fall from within the untreated SPZs. Larger wood would begin to be recruited from farther up the slopes as the treated stands reach greater heights. 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 by SPZ retention zones, the proposed actions are not expected to cause short-term changes to fish habitat at the site or downstream.

9. **Comment:** *Please consider the need for habitat diversity and the importance of hardwoods for various wildlife species, and incorporate diverse habitat needs into the prescription for the area. In other words, leave some hardwoods in the units in patches mixed in with the areas where conifer enhancement will occur.*

Response: As stated in the EA (pg. 19) "Tree selection would be designed to leave a range of diameter distribution, maintain or increase the proportion of minor species, create variable density of leave trees, and retain legacy and wildlife tree structure while meeting target densities". Species diversity would be increased, as thinning would target Douglas-fir, increasing the relative proportion of the other tree species. Furthermore, treatment would promote the establishment of seedlings, which are likely to include hardwood, western hemlock and western red cedar.

10. **Comment:** *Project analysis should separately discuss each of the Aquatic Conservation Strategy objectives. Any commercial harvest activities or road construction in key watersheds or municipal watersheds should be avoided in order to protect water quality.*

Response: The projects are in conformance with the 1995 ROD/RMP which does incorporate ACS objectives or key watersheds. The projects are not located in a municipal watershed or key watershed. Impacts to water and aquatic habitat are included in Sections 3.2.4 and 3.2.5.

9.1.1.2 ***American Forest Resources Council***

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

Response: Economic feasibility is one of the many factors taken into account when offering a timber sale. Road work costs, yarding costs and other incidental costs versus the acreage and volume taken are calculated and an Interdisciplinary Team of specialists including those in EA Section 5.0, Table 27, come to a consensus on what alternative to pursue for analysis.

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

Response: As stated in the EA (Section 2.2.2 on pp. 17 and 18) winter hauling would be allowed on a portion of the total amount of haul roads except during periods of rainfall when water is flowing off of road surfaces.

3. Comment: *The AFRC would like to see flexibility for fuels treatments. Rather than specifying a method of accomplishing resource objectives, BLM should identify objectives and any limitations to resource disturbance. The purchaser could then identify the method they could implement given their particular employee skills and equipment mix.*
Response: The purpose of the fuels treatment recommended in the EA is to reduce or mitigate slash hazard and risk along roads and landings or to meet silvicultural objectives (planting) in the patch cut areas. Besides the option of hand or machine piling of slash concentrations, the EA (p. 20) specifies: "Whenever possible alternative waste recycling of slash material should be encouraged. This may be: providing firewood to the public, chipping for co-gen power production, chipping for soil amendments, soil protection, etc." This is an attempt to provide some flexibility that would still meet the objective of reducing fire hazard and risk or meeting silviculture objectives. However, leaving slash concentrations along roads and landings would not be an option.

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

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

5 Comment*: On stands that must be helicopter logged, the BLM should consider allowing mechanical harvesting and pre-bunching of logs. This will make all phases of helicopter logging more economical and also treat the slash.*

Response: As stated in EA (Pg. 18) **"**Ground based yarding would take place generally on slopes less than 35 percent". This would include mechanical harvesters and bunchers.

9.2 Appendix B: Response to Public Comments Received on the Upper and Lower Alsea River Watershed Restoration (EA#OR080-08-08)

Two letters were received commenting on the Upper and Lower Alsea River Watershed Restoration Environmental Assessment. Although the letters communicated a number of issues and opinions on forest management in general, the response to comments below only discusses those specifically directed to the Environmental Analysis which was made available for public review from July 16, 2009 to August 16, 2009. Comments are in *italics.* The BLM response follows each comment.

9.2.1 **Summary of comments and BLM responses**

The following addresses comments raised in two letters 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.

Oregon Wild, Chandra LeGue
Received August 17, 2009

1. **Comment:** *We wish you were not prioritizing the treatment of mid-seral naturally regenerated stands. There is less consensus in regards to the benefits of thinning in these stands compared to younger stands that were replanted after past harvest.*

Response*:* As stated in the EA (p. 2) "Current forest stand exam data indicates early and mid seral forests in the project areas have declining growth rates and limited structural diversity. These second-growth forests have stands characterized by a single-layered, dense, overstory canopy with little to no large wood remaining from the primary growth stand. There is a need to improve wildlife and aquatic habitat on approximately 768 acres of early and mid seral forests by reducing stand densities using variable spacing methods and creating immediate terrestrial CWD. This could lead to an increase in fish and late successional wildlife species populations".

2. **Comment:** *Please do not thin in riparian reserves until the BLM has a more credible plan for long-term recruitment of adequate levels of snags and CWD.*

Response: As stated in the EA (pp. 48&49) the current level of CWD is deficient in Bummer Ridge and Buck Roberts. As stated in the EA (p. 64) Project 1 is anticipated to enhance local forest habitat conditions and thereby benefit numerous wildlife species, especially those species that are associated with late-seral forest structure and CWD. All proposed units would benefit from augmentation of CWD which would provide larger pieces of hard material sooner than if left untreated. The reduced canopy closure, loss of small snags, increased growth of shrubs, and created slash may also disrupt the current pattern of wildlife use for the short-term.

3. **Comment:** *Please consider the carbon-climate consequences of logging. Thinning may have some ecological benefits but it also has carbon-climate costs that must be weighed.*

Response: There is a direct beneficial effect on climate change of decreased GHG emissions from these acres being thinned because the risk of acres being burned by uncharacteristically severe wildfires would be reduced, and there is an indirect beneficial effect by treating these acres because live stands of trees would retain higher capacity to sequester carbon dioxide compared to stands killed by uncharacteristically severe wildfires, especially if not immediately reforested.

Plantation thinning recommendations

4. **Comment:** *When conducting commercial thinning projects take the opportunity to implement other critical aspects of watershed restoration especially pre-commercial thinning, restoring fish passage, reducing the impacts of the road system, and treating invasive weeds.*

Response: The BLM has completed NEPA documents that provide for pre-commercial thinning, fish passage restoration, road decommissioning and the management of non-native plant species within the Marys Peak Resource Area.

5. **Comment:** *Focus on treating the youngest stands that are most "plastic" and amenable to restoration. Generally retain all the largest trees, then "free thin from below" retaining some smaller trees in all age-size classes.*

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

   As stated in the EA (pg. 19) "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 73 TPA.

6. **Comment:** *Retain and protect under-represented conifer and non-conifer trees and shrubs. Strive for a variable density outcome. Use skips and gaps within units to help achieve diversity. Gaps should be small, while skips should be a little larger, but even small clumps and patches of trees are desirable. Gaps should not be clearcut but rather should retain some residual structure in the form of live or dead trees.*

   Response: As stated in the EA (pg.19) Residual tree densities range from 100 to 150 sq. ft. (square feet) basal area and approximately 37 to 89 TPA. Tree selection would be designed to leave a range of diameter distribution, maintain or increase the proportion of minor species, create variable density of leave trees, and retain legacy and wildlife tree structure while meeting target densities.

7. **Comment:** *Retain abundant snags and coarse wood both distributed and in clumps so that thinning mimics natural disturbance. Retention of dead wood should generally be proportional to the intensity of the thinning, e.g., heavy thinning should leave behind more snags not less. Retain wildlife trees such as hollows, forked tops, broken tops, leaning trees, etc.*

   Response: See Response #2

8. **Comment:** *Thin heavy enough to stimulate development of understory vegetation, but don't thin too heavy. Recognize that thinning captures mortality and that plantation stands are already lacking critical values from dead wood due to the unnatural stand history of all clearcut and planted stands.*

   Response: See Response #2

9. **Comment:** *If using whole tree yarding or yarding with tops attached to control fuels, the agency should top a portion of the trees and leave the greens in the forest in order to retain nutrients on site.*

   Response: There is no requirement to utilize whole tree yarding or yarding with tops attached within the EA. Historically, the majority of BLM timber sale purchasers have chosen not to utilize

whole tree yarding when using skyline and ground based yarding systems within density management treatments (which Buck Roberts Mid-Seral Enhancement entails).

On a typical Marys Peak thinning timber sale, tail and lift trees are needed to obtain one-end suspension during skyline yarding. These trees are topped with the top of the tree left in the forest that provides terrestrial habitat along with a variety of other uses with the remaining standing stem providing future snag habitat.

10. **Comment:** *Avoid impacts to raptor nests and enhance habitat for diverse prey species.*

Response: As stated in the EA (pg. 19) "Any tree found to have a stick or ball nest, regardless of size (tree or nest) would be protected". As stated in the EA (p. 69) "Post treatment stand structure and canopy closure (greater than 40 percent) is expected to maintain the dispersal habitat function of all units. A small percentage of two critical habitat units would be affected by treatment of Project 1 units, but since these treatments would be expected to accelerate the development of nesting structure and improve the structural diversity over the long term they are unlikely to alter the current conservation value of the CHUs".

11. . **Comment:** *Take proactive steps to avoid the spread of weeds. Use canopy cover to suppress weeds.*

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

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

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

12. **Comment:** Buffer streams from the effects of heavy equipment and loss of bank trees and trees that shade streams. Mitigate for the loss of LWD input by retaining extra snags and wood in riparian areas. Recognize that thinning captures mortality that is not necessarily compensated by future growth.

Response: The EA (pg. 19) includes design features that would protect streams from the effects of equipment or loss of bank trees by implementing **s**tream protection zones (SPZs) where no cutting would be permitted along all streams and identified wet areas within the harvest area. 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. No skyline or ground-based yarding would be permitted in or through SPZs.

As noted in response # 2, all existing snags and CWD would be reserved, except where they pose a safety risk or affect access and operability. Any snags or logs felled or moved for these purposes would remain on site within the project area. We believe the design features for the protection of existing down logs and snags as stated in the EA provides the necessary protection for these resources and removes any incentive for needlessly felling or removing them. No refueling would be allowed within 100 feet of any standing or running water. Woody material removed from stream crossing for culvert maintenance must be retained in the stream network.

13. Comment: *Avoid road construction. Where road building is necessary, ensure that the realized restoration benefits far outweigh the adverse impacts of the road. Rank new road segments according to their relative costs (e.g. length, slope position, soil type, ease of rehabilitation, weed risk, native vegetation impacts, etc.) and benefits (e.g. acres of restoration facilitated), then use that ranking to consider dropping the roads with the lowest ratio of benefits to costs. Do not allow log hauling during the wet season.*

Response: The majority of the new construction consists of relatively 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 then computed the cost:benefit ratio of the number of acres treated per mile of road construction.

Buck Roberts Timber Sale

Road #	Primary Road Work	Miles	Associated Unit Acres	Acres of Unit/Mile of Road
P1	New	0.04	3.5	88
P2	New	0.04	7	175
P3	New	0.17	19	112
P4	New	0.12	30	250
P5	New	0.31	20	65
P6	New	0.12	5	42
P7	New	0.21	17	81
P8	New	0.24	29	121
P9	New	0.08	9	113

Bummer Ridge Timber Sale

Road #	Primary Road Work	Miles	Associated Unit Acres	Acres of Unit/Mile of Road
P1	New	0.10	8	80
P2	New	0.03	7	233
P3	New	0.12	19	158
P4	New	0.09	11	122
P5	New	0.03	13	433
P6	New	0.09	13	144
P7	New	0.20	18	90
P8	New	0.08	16	200
P9	New	0.03	8	267

North Fork Overlook

Road #	Primary Road Work	Miles	Associated Unit Acres	Acres of Unit/Mile of Road
P1	New	0.28	118	421
P2	New	0.32	32	100
P3	New	0.05	12	240
P4	New	0.05	15	300

14. **Comment:** *Develop an alternative that addresses carbon and climate by (a) deferring harvest of older forests to store carbon and provide biodiversity and connectivity and (b) thin younger stands to increase forest resilience and diversity and connectivity.*

Response: The stands to be treated in Buck Roberts Mid-Seral Enhancement Project 1 range in age from 34 to 65 years. As stated in the EA (p.61) "Treatment includes variable density thinning, creation of small gaps around "open grown" trees, and retention of small clumps. This would increase spatial and structural diversity of the stand. Species diversity would be increased, as thinning would target Douglas-fir, increasing the relative proportion of the other tree species. Furthermore, treatment would promote the establishment of seedlings, which are likely to include hardwood, western hemlock and western red cedar. With treatment, the current stand average height to diameter ratios of 68 (calculated from the quadratic mean diameter and the height of the 40 largest trees per acre), would remain the same with 30 years of growth indicating maintenance of relatively good tree stability over time.

15. Comment: *Make the NEPA analysis transparent and explicit on all these issues*

Response: This Decision Rationale and Final Decision document includes the entire list of comments received from Oregon Wild concerning the Environmental Assessment for Buck Roberts Mid Seral Enhancement Project 1. We believe we have provided responses to the comments in a clear and concise manner.

Thinning in Riparian Reserves

16. **Comment:** *Thinning in riparian reserves does in fact raise ambient air temperatures that the microclimate effects must be accounted for.*

Respons*e:* As stated in the EA (p. 79) **"**For Project 1 harvest areas, appropriate SPZ's have been designed following the 1995 RMP direction and would maintain the riparian characteristics and shade requirements needed to maintain stream temperatures. The SPZ widths along all streams in both projects would maintain a minimum of 80 percent shade for the streams. Because stream shading would be maintained there are no anticipated changes to stream temperature from the implementation of these projects".

In addition, as stated in the EA (p. 88) "According to the stream shading sufficiency analysis done for the proposed treatment units the proposed SPZs of 55 feet was sufficient to protect critical shade in the primary shade zone (Snook 2009). The proposed vegetation treatment in the

secondary shade zone (approximately 210 feet from the stream) would not result in canopy reduction of more than 50 percent. Protection of stream shading thru application of SPZs and silviculture prescriptions retaining adequate canopy cover would be expected to maintain the existing stream temperature (Wegner 2009). Based on the shade sufficiency analysis, the hydrology report water quality analysis, and the project design features, the proposed actions are unlikely to impact fish habitat both at the treatment site and downstream".

17. **Comment:** *The final spotted owl recovery plan (FRP) (p 50) describes spotted owl habitat as including "a high incidence of large trees with various deformities (large cavities, broken tops, mistletoe infections, and other evidence of decadence); large snags; large accumulations of fallen trees and other woody debris on the ground; …" These features, especially the large accumulations of down wood, cannot develop under an aggressive thinning regime.*

Response As stated in the EA (p.61) "Treatment includes variable density thinning, creation of small gaps around "open grown" trees, and retention of small clumps. This would increase spatial and structural diversity of the stand."

Residual trees would increase in diameter and crown depth/width. Limb diameter and crown depth would be maintained because trees would be released from competition that causes growth decrease and loss of shaded lower limbs. The predicted average increase in quadratic mean diameter (QMD) for overstory trees as a result of density management thinning would result in an additional 1.9 inch of diameter growth in 30 years, 47 percent more diameter growth than without treatment.

Species diversity would be increased, as thinning would target Douglas-fir, increasing the relative proportion of the other tree species. Furthermore, treatment would promote the establishment of seedlings, which are likely to include hardwood, western hemlock and western red cedar.

Thinning short-circuits the snag recruitment that results from inter-tree competition (Carey, 1999), and very little density mortality (2.1 trees per acre) is expected to occur for 30 years after treatment, and most of that would be smaller (11 inches DBHOB average) hardwood trees remaining after thinning that are in an overtopped position and are lost from the stand as density increases again following thinning.

Measures to protect existing large snags are likely to be effective, but many of the smaller snags would likely be felled for safety reasons. Inputs resulting from harvest consist of limbs and tops, breakage and cull and incidentally felled or topped trees that would be left on site. The harvest input would likely result in a gain of 200 cubic feet per acre of CWD in skyline yarding areas and about 100 cubic feet per acre in ground-based yarding areas. In the long term, due to increased diameter growth resulting from density management, larger trees would be available for recruitment for CWD.

As stated in the EA(p.69) "The gradual transition in structural characteristics of the treated stands to more closely resemble late-seral forest (larger diameter trees and limbs, sub-canopy development, greater tree species diversity, greater volume and size of hard CWD, canopy gaps)"

18. **Comment:** *Short-term recruitment of LWD would be maintained and in the long-term thinning would beneficially affect LWD recruitment in riparian reserves; (Models show otherwise. Thinning*

captures mortality and increases vigor, thereby reducing and delaying recruitment of LWD.)

Response: The project area streams are primarily small first and second order streams. Channels widths are typically small for these stream types. The project area channels would be buffered with at least 55 feet SPZs where the existing stand would remain untreated. The referenced paper Roni et al 2002 is supported by reference to Beechie, T., S. Bolton, G. Pess, R. Bilby, and P. Kennard. 2000. Modeling Recovery Rates and Pathways for Woody Debris Recruitment in Northwestern Washington Streams. North American Journal of Fisheries Management. 20:436–452. The modeling and analysis conducted in Beechie (2000) excluded no-treatment buffers in its analysis of pool forming wood. The modeling assumes that treatment would include the full stand complement up to and including trees adjacent to the stream channel. For the Upper and Lower Alsea River projects the small pool forming size pieces of wood of concern would largely be unaffected by proposed actions as the trees of sufficient height to span the stream would necessarily be small trees adjacent to the small streams. With the incorporation of SPZs these small pool forming trees would largely be protected. Larger pieces of coarse wood located further away from the streams (greater than 20 feet) that may be impacted due to harvest were addressed in the EA and are further discussed below.

For clarification coarse wood debris, noted in ACS Objective 8, was most likely meant to cover wood recruitment that may occur from the riparian area. ACS objective 8 states " Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosions, bank erosion, and channel migrations and to supply amounts and distribution of coarse woody debris sufficient to sustain physical complexity and stability." From pg B-10 of the NWFP ROD it states " Complying with ACS objectives means that an agency must manage the riparian dependent resources to maintain the existing conditions or implement actions to restore conditions. The baseline to assess maintain or restoring the condition is developed thru a watershed analysis. Improvement relates to restoring biological and physical process within their range of natural variability." However, for purposes of applying the Standards and Guidelines of the ROD, the glossary definition on pg F-4 defines CWD as follows "Portion of the tree that has fallen or been cut and left in the woods. Usually refers to pieces at least 20 inches in diameter (FEMAT)."

In regards to impacts to coarse wood, the EA analyzed coarse wood recruitment (pp. 99 to 101) and found that proposed density management treatments in the project area would generally occur 65 feet or more from stream channels. Studies have shown that approximately 70 percent of wood recruitment occurs within 65 feet of the stream edge (McDade et al 1990, Van Sickle and Gregory 1990, May and Greswell 2003). Treatment of the riparian reserves, leaving at least 65 foot buffers, would be expected to leave at least 70 percent of the short-term woody debris recruitment area unaffected at the site. Using the relative fractions of source wood distances noted in McDade (1990), Van Sickle and Gregory (1990), May and Greswell (2003) compared to proposed stand treatment approximately 84 percent of the potential recruitment wood would be retained in the wood recruitment zone following harvest. The majority of coarse woody debris would continue to fall from within the untreated SPZ, and short-term recruitment of the existing woody debris is expected to be largely maintained with proposed treatments.

As stated in the EA (p. 100) proposed thinning in the riparian treatment areas is anticipated to increase the average growth of the remaining trees between 30 to 58 percent over 30 years

compared to not treating the stands (Snook 2009). Larger wood would begin to be recruited from farther up the slopes as the treated stands reach greater heights. 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 by SPZ retention zones, the proposed actions are not expected to cause short-term changes to fish habitat at the site or downstream. In the long-term the increase in the size of trees in one site potential portion of RR LUA could benefit LWD recruitment to the stream channel, thus potentially improving the quality/complexity of aquatic habitat adjacent to the treatment areas in the future. As the Beechie (2000) study noted that "changing to a larger target diameter, such as the average diameter of LWD in old growth streams (e.g., Bilby and Ward 1989), will cause the neutral line to shift upward and to the left and a greater proportion of stands will show accelerated LWD recruitment after thinning." The proposed action is intended to address development of stands that emulate late-seral characteristics. Therefore targeting stands for mature CWD recruitment patterns would be appropriate. In the long-term, beneficial growth in the size of trees within one site potential tree height of streams could enhance LWD recruitment to the stream channel, thus potentially improving the quality/complexity available for future recruitment downstream.

19. **Comment:** *In our scoping letter, we urged you to "work with the Alsea Stewardship Group to gather input from local, very engaged and knowledgeable people with a demonstrated interest in this area. To my knowledge, this did not happen with this project. It's unfortunate, as I believe several groups and individuals would benefit from a close working relationship with the BLM as projects are developed.*

    Response: During the public scoping period members of this group were notified of the proposed projects through a letter and corresponding maps. The BLM did not receive any interest from members of this group during the scoping process.

    American Forest Resource Council, Jacob Groves
    Received: August 13, 2009

    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 6.0, Table 11, come to a consensus on what alternative to pursue for analysis. Alternatives

    2. **Comment:** *"For this reason AFRC supports the Alternative 2 (the proposed alternative) as it best meets the purpose and need of the project while maximizing revenues to the government, all while protecting natural resource values. AFRC supports the regeneration harvest of stands that have reached Culmination of Mean Annual Increment(CMAI) on lands that are designated General Forest Management in the RMP*

    Response: We concur. See response to comments #2 and #14 on pages 11 and 16.

    3. Comment: *"Seasonal, recreational, and wildlife restrictions often make timber sales extremely difficult to complete within contract timelines"*

Response: The Ability of our purchasers to complete sales within contract timelines is considered by our Interdisciplinary Team of specialists.

4. Comment: "*AFRC also would like to voice support for thinning treatments in the riparian areas of the Upper and Lower Alsea River Watershed Restoration"*

Response: We are not conducting traditional thinning in the riparian reserves. The EA design features on page on 10 state"Within the density management areas, trees within 60 to 80 feet of dominant overstory trees would be cut (gap created). These gaps would average up to one per two acres. The cut trees would be harvested."