K-LINE LATE SUCCESSIONAL RESERVE ENHANCEMENT ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT

Environmental Assessment Number OR-080-05-08

March 2, 2006

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:	Brad Keller 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

BLM
Salem District

Abstract: This environmental assessment (EA) discloses the predicted environmental effects of one project on federal land located in Township 7 South, Range 7 West, Section 31, Willamette Meridian and within the Upper Siletz River and Rickreall Creek Watersheds. The project proposes to enhance conditions for the development of late seral forest habitat on approximately 304 acres of early to mid-seral forest land. The action would occur within Late-Successional Reserve (LSR) within the North Coast Adaptive Management Area and Riparian Reserve (RR) Land Use Allocations (LUA).

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/PL-06/016+1792

FINDING OF NO SIGNIFICANT IMPACT

Introduction

The Bureau of Land Management (BLM) has conducted an environmental analysis (Environmental Assessment Number OR080-05-08) for a proposal to conduct density management on 40 to 50 year-old stands in Late-Successional Reserve (LSR) and Riparian Reserve (RR) Land Use Allocation's (LUAs) within the North Coast Adaptive Management Area to increase tree growth and enhance species and structural diversity. The project area is on BLM managed lands in Township 7 South, Range 7 West, Section 31, Willamette Meridian.

Implementation of the proposed action will conform to management actions and direction contained in the attached *K-Line Late Successional Reserve Enhancement Environmental Assessment* (K-Line LSR Enhancement EA). The K-Line LSR Enhancement EA is attached to and incorporated by reference in this Finding of No Significant Impact (FONSI) determination. The analysis in this EA is site-specific and supplements analyses found in the *Salem District Proposed Resource Management Plan/Final Environmental Impact Statement*, September 1994 (RMP/FEIS) (EA p. 1). The K-Line project has 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 Marys Peak Resource Area (EA pp. 1-2). Consultation with U.S. Fish and Wildlife Service and National Marine Fisheries Service is described in Section 7.1 of the EA.

The EA and FONSI will be made available for public review March 15, 2006 to April 15, 2006. The notice for public comment will be published in a legal notice by the *Polk County Itemizer Observer* newspaper. Comments received by the Marys Peak Resource Area of the Salem District Office, 1717 Fabry Road SE, Salem, Oregon 97306, on or before April 15, 2006 will be considered in making the decisions for this project.

Finding of No Significant Impact

Based upon review of the K-Line LSR Enhancement 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 documented 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 Siletz River and Rickreall Creek 5th-field Watersheds and the project area boundaries. The proposed action would occur on approximately 304 acres of BLM LSR and RR LUA's within the North Coast Adaptive Management Area LUA, encompassing less than 0.5% of the forest cover within the Upper Siletz River and less than 0.001% of the forest cover within the Rickreall Creek Watersheds [40 CFR 1508.27(a)].

Intensity:

1. *The Project* is unlikely to a have any significant adverse impacts on the affected elements of the environment (EA section 3.1) - vegetation, soils, water, fisheries/aquatic habitat, wildlife and fuels/air quality resources. The following is a summary of the design features that would reduce the risk of affecting the above resources (EA section 2.2.2).

   - ✓ Seasonally restricting ground-based yarding, road construction and timber hauling operations to avoid runoff and sedimentation,
   - ✓ Operating equipment on top of slash and logging debris when possible to minimize compaction,
   - ✓ Installing erosion control measures as needed [water bars, sediment traps in ditchlines, silt fences, straw bales, and grass seeding exposed mineral soil areas],
   - ✓ Stream protection zones (no cutting/no yarding) of at least 50 feet slope distance would be established along streams and identified wet areas within the treatment area.
   - ✓ Decommissioning new road construction and reconstruction after the completion of the project.
   - ✓ Existing snags and coarse woody debris would be reserved, except within road rights of way, yarding corridors/skid trails or for safety reasons.

   With the implementation of the project design features described in EA section 2.2.2, potential effects to the affected elements of the environment anticipated to be site-specific and/or not measurable (i.e. undetectable over the watershed, downstream, and/or outside of the project area) The project is designed to meet RMP standard and guidelines, modified by subsequent direction (EA section 1.3); and the effects of this project would not exceed those effects described in the RMP/FEIS [40 CFR 1508.27(b) (1), EA section 3.2].

2. *The Project* would not affect:
   - ✓ Public health or safety [40 CFR 1508.27(b)(2)];
   - ✓ Unique characteristics of the geographic area [40 CFR 1508.27(b)(3)] because there are no historic or cultural resources, parklands, prime farmlands, wild and scenic rivers, wilderness, or ecologically critical areas located within the project area (EA sections 3.1);
   - ✓ Districts, sites, highways, structures, or other objects listed in or eligible for listing in the National Register of Historic Places, nor would the proposed action cause loss or destruction of significant scientific, cultural, or historical resources [40 CFR 1508.27(b)(8)] (EA section 3.1).

3. *The Project* is not unique or unusual. The BLM has experience implementing similar actions in similar areas without highly controversial [40 CFR 1508.27(b)(4)], highly uncertain, or unique or unknown risks [40 CFR 1508.27(b)(5)].

4. *The Project* does not set a precedent for future actions that may have significant effects, nor does it represent a decision in principle about a future consideration [40 CFR 1508.27(b)(6)]. The BLM has experience implementing similar actions in similar areas without setting a precedent for future actions.

5. The interdisciplinary team evaluated the project 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 304 acres, encompassing less than 0.5% of the forest cover within the Upper Siletz River and less than 0.001% of the forest cover within the Rickreall Creek Watersheds), and duration [direct effects would occur over a maximum period of 4-6 years (EA section 3.2)].

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

   Wildlife:
   - The consultation with the U. S. Fish and Wildlife Service (USFWS) concurred with the determination of "No Effect" to the northern spotted owl and marbled murrelet because no suitable habitat is present within the project area.
   - Designated Critical habitat (Critical Habitat Unit OR-44) for the spotted owl is not likely be adversely affected because less than 1.3 % of the dispersal habitat within the Critical Habitat Unit would be affected; and the habitat would continue to function as dispersal habitat after thinning is completed.
   - This proposed action has been designed to incorporate all appropriate design standards set forth in the Biological Assessment to ensure compliance with the Terms and Conditions included within the Biological Opinion (reference #1-7-2005-F-0005; USDI-FWS 2004).

   Fish: A determination has been made that this proposed project would have 'no effect' on UWR steelhead trout and chinook salmon and Oregon chub because the project is approximately 7 and 24 miles uptream from ESA listed fish habitat and project design features include no harvest activity within stream protection zones, dry season hauling and post-project leave tree densities of 46-80 trees per acre. The proposed K-Line project is not expected to affect Essential Fish Habitat due to distance of all activities associated with the K-Line project from occupied habitat.

7. *The Project* does not violate any known Federal, State, or local law or requirement imposed for the protection of the environment [40 CFR 1508.27(b)(10)].

Prepared by: _____ _____
Gary Humbard, Team Lead Date

Reviewed by: _____ _____
Carolyn Sands, (NEPA) Date

Approved by: _____ _____
Brad Keller, Field Manager Date
Marys Peak Resource Area

Table of Contents

1.0 INTRODUCTION....1
1.1 Project Covered in this EA....1
1.2 Project Area Location....1
1.3 Conformance with Land Use Plans, Policies, and Programs....1
1.4 Decision to be made....3
1.5 Purpose of and Need for Action....5
2.0 Alternatives....6
2.1 Alternative Development....6
2.2 Alternative 1 (Proposed Action)....6
2.2.1 Connected Actions....6
2.2.2 Project Design Features....8
2.3 No Action Alternative....11
2.4 Alternatives Considered but not Analyzed in Detail....12
3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS - COMMON TO ALL PROJECT AREAS....14
3.1 Identification of Affected Elements of the Environment....14
3.2 Affected Environment and Environmental Effects....17
3.2.1 Vegetation....17
3.2.1.1 Alternative 1 (Proposed Action)....18
3.2.1.2 Cumulative Effects:....20
3.2.1.3 No Action Alternative....20
3.2.2 Soils....21
3.2.2.1 Alternative 1 (Proposed Action)....22
3.2.2.2 Cumulative Effects:....25
3.2.2.3 No Action Alternative....25
3.2.3 Water....25
3.2.3.1 Alternative 1 (Proposed Action)....27
3.2.3.2 Cumulative Effects:....28
3.2.3.3 No Action Alternative....29
3.2.4 Fisheries/ Aquatic Habitat....29
3.2.4.1 Alternative 1 (Proposed Action)....31
3.2.4.2 Cumulative Effects:....33
3.2.4.3 No Action Alternative....33
3.2.5 Wildlife....34
3.2.5.1 Alternative 1 (Proposed Action)....36
3.2.5.2 Cumulative Effects:....37
3.2.5.3 No Action Alternative....37
3.2.6 Fuels\Air Quality....38
3.2.6.1 Alternative 1 (Proposed Action)....38
3.2.6.2 No Action Alternative....39
4.0 Compliance with the Components of the Aquatic Conservation Strategy....40
5.0 COMPARISON OF ALTERNATIVES WITH REGARD TO PURPOSE AND NEED....40
5.1 Comparison of Alternatives With Regard to the Purpose and Need....40
6.0 LIST OF PREPARERS....41
7.0 CONTACTS AND CONSULTATION....42
7.1 Agencies, Organizations, and Persons Consulted (ESA Section 7 Consultation)....42

7.2 Cultural Resources - Section 106 Consultation and Consultation with State Historical Preservation Office:....42
7.3 Public Scoping and Notification-Tribal Governments, Adjacent Landowners, General Public, and State County and local government offices:....43
7.3.1 30-day public comment period....43
8.0 MAJOR SOURCES AND COMMON ACRONYMS....43
8.1 Major Sources....43
8.1.1 Interdisciplinary Team Reports:....43
8.1.2 Additional References:....44
8.2 Common Acronyms....46
9.0 APPENDICES....47
9.1 Appendix 1 - Aquatic Conservation Strategy Objectives....47
9.1.1 Documentation of the Projects' Consistency with the Nine Aquatic Conservation Strategy Objectives....47
9.2 Appendix 2 - Response to Scoping Comments....48
9.2.1 Summary of comments and BLM responses....48
9.2.1.1 Oregon Natural Resource Council (March 30, 2004)....48
9.3 Appendix 3 – K-LINE MARKING GUIDE....51
9.4 Appendix 4 – Compliance with Current Survey and Manage Direction....52
2001 ROD Compliance Review: Survey & Manage Wildlife Species....52
2001 ROD Compliance Review: Survey & Manage Botany Species....54

1.0 INTRODUCTION

1.1 Project Covered in this EA

One project will be analyzed in this EA. K-Line Late Successional Reserve Enhancement is a proposal to perform density management on approximately 304 acres of 40 to 50 year old stands within Late Successional Reserve (LSR) and Riparian Reserve (RR) Land Use Allocations (LUAs).

1.2 Project Area Location

The project area is located approximately 13 air miles west of Dallas, Oregon, in Polk County on forested land managed by the Marys Peak Resource Area, Salem District of the Bureau of Land Management (BLM). The project area lies within the Upper Siletz River and Rickreall Creek Watersheds and is within Township 7 South, Range 7 West, Section 31, Willamette Meridian (Map 1).

1.3 Conformance with Land Use Plans, Policies, and Programs

The K-Line project has 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): The RMP has been reviewed and it has been determined that the K-Line project conforms 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 this project (RMP pp.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) and results of the Annual Species Review (ASR) 2001 (BLM IM OR 2002-064), 2002 ASR (BLM IM OR 2003-050) and 2003 ASR (BLM IM OR-2004-034). 4/ *Record of Decision Amending Resource Management Plans for Seven Bureau of Land Management Districts and Land and Resource Management Plans for Nineteen National Forests within the Range of the Northern Spotted Owl, Decision to Clarify Provisions Relating to the Aquatic Conservation Strategy*, March 2004 (ACSROD).

The analysis in the K-Line LSR Enhancement 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 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). The RMP/FEIS is amended by 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); and the *Final Supplemental Environmental Impact Statement, Clarification of Language in the 1994 Record of Decision for the Northwest Forest Plan National Forests and Bureau of Land Management Districts Within the Range of the Northern Spotted Owl*, October 2003 (ACS/FSEIS).

The following documents provided additional direction in the development of the K-Line project: 5/ *Late Successional Reserve Assessment for Oregon's Northern Coast Range Adaptive Management Area* [LSRA (Late-Successional Reserve RO269, RO270 & RO807)], 1998; 6/ *Rowell, Mill, Rickreall Creeks and Luckiamute River Watershed Analysis,* 1998; 7/ *Upper Siletz Watershed Analysis,* 1996.

All of the above documents, along with the K-Line interdisciplinary team (IDT) reports (EA section 8.1.1), are hereby incorporated by reference in the K-Line LSR Enhancement EA and are available for review in the Salem District Office. Additional information about the proposed project is available in the K-Line Late Successional Reserve Enhancement Project EA Analysis File (NEPA file), also available at the Salem District Office.

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

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

The order further directs "Defendants shall not authorize, allow, or permit to continue any logging or other ground-disturbing activities....unless such activities are in compliance with the provisions of the 2001 ROD (as amended or modified as of March 21, 2004)".

The litigation over the amendment that eliminated the Survey & Manage mitigation measure from the Northwest Forest Plan does not affect the K-line LSR Enhancement Project. All category A, C and non-fungi B species that were required to be surveyed for under the 2001 ROD, were surveyed to the specific taxa protocols and any known sites found during field surveys have been protected or removed from within the project area.

The RA reexamined the individual project record for the K-Line LSR Enhancement Project in light of the Court ordered remedy. The wildlife and botanical compliance reviews are included in Appendix 4. As stated above, the RA completed all pre-disturbance surveys and site management as required by survey protocols and management recommendations in compliance with the 2001 ROD. There are no "known sites" of any Federal or Oregon State listed threatened or endangered or Bureau special status or SEIS (survey and manage) special attention vascular plant, lichen or bryophyte species within the project area nor were any found during field surveys.

Pre-project fungi clearances are only required for *Bridgeoporous nobillisimus. Bridgeoporous nobillisimus* was not found during subsequent surveys. Pre-project clearances are not required for all other fungi species because they are considered "not practical to survey for".

However, the following SEIS (survey and manage) special attention fungi species were found within the proposed project area during field surveys; *Rickenella swartzii*, *Cudonia monticola*, *Gomphus kaufmannii* and *Ramaria cyaneigranosa*. All known sites for these species would be protected in the project area. There are no other known sites of any Federal or Oregon State listed threatened or endangered or Bureau special status or SEIS (survey and manage) special attention fungi species within the project area.

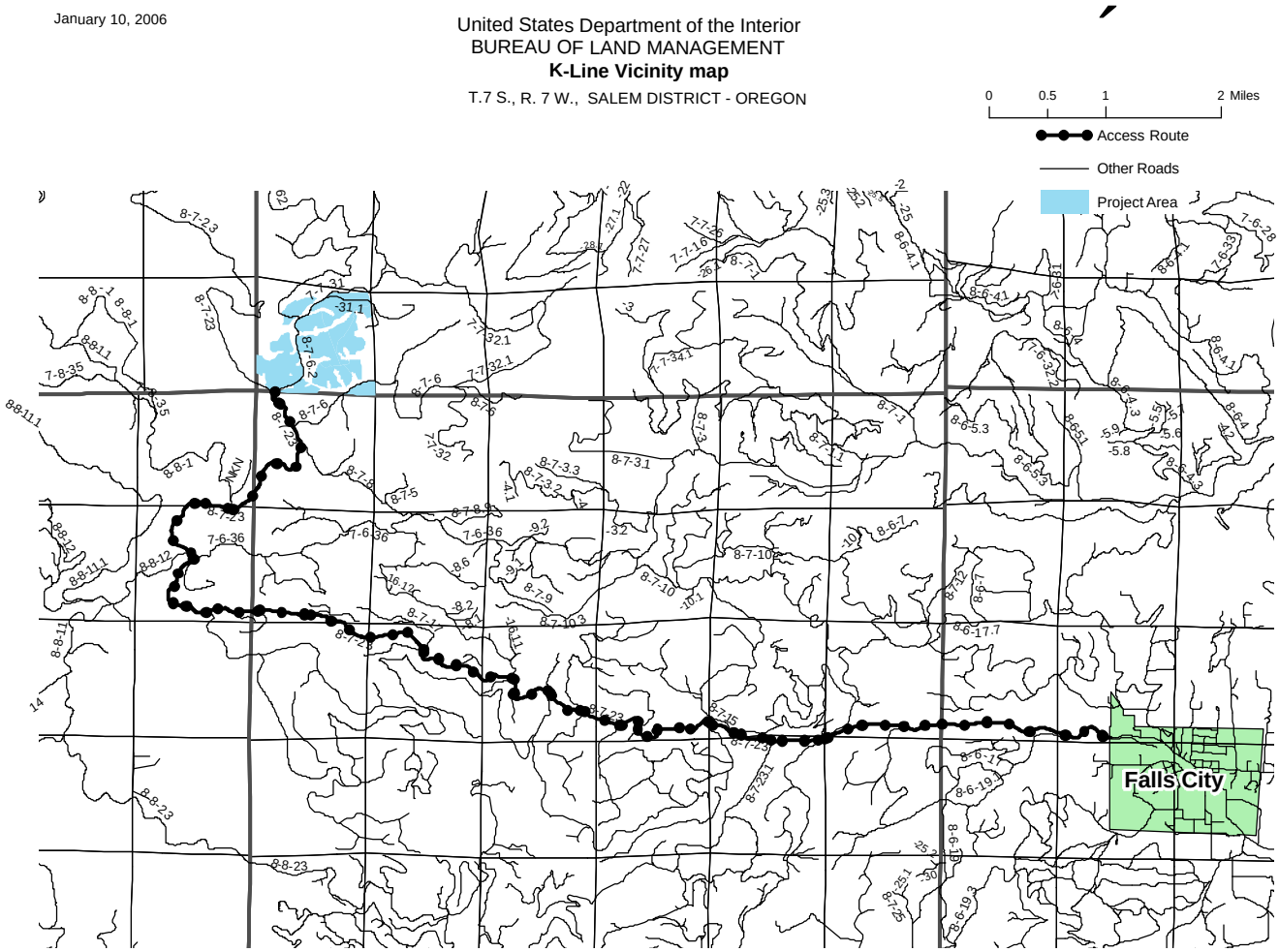
Based on the preceding information regarding the status of surveys for Survey & Manage wildlife and botany species and the results of those surveys, the K-Line LSR Enhancement Project complies with the provisions of the 2001 ROD, as amended or modified as of March 21, 2004. For the foregoing reasons, this EA is in compliance with the 2001 ROD as stated in Point (3) on page 14 of the January 9, 2006, Court order.

1.4 Decision to be made

The decision to be made by the Marys Peak Field Manager is:

- Whether to approve the K-Line project, as proposed, not at all, or to some other extent.
- Whether site specific impacts would require supplemental/additional information to the analysis documented in the RMP/FEIS through a new EIS.

Map 1: Vicinity Map



1.5 Purpose of and Need for Action

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

As a follow up to the findings of the Upper Siletz and Rowell, Mill, Rickreall Creeks and Luckiamute River Watershed Analyses, the Marys Peak Resource Area silviculture and wildlife staff began prioritizing areas within the Resource Area that would benefit from density management and which would contribute to the provincial strategies for recovering conditions across the landscape. The proposed project is intended to implement a subset of specific management opportunities that were identified within the Upper Siletz and Rickreall Creek Watershed Analyses. The purpose and need for action is summarized below:

- To manage developing forest stands and wildlife habitat in the LSR LUA so that:
  - ✓ Late-successional forest conditions, which serve as habitat for late-successional forest species, can be developed, accelerated, and enhanced (LSRA p. 2);
  - ✓ Plan and implement silvicultural treatments inside Late-Successional Reserves that are beneficial to the creation of late successional habitat (RMP p. 16). This implementation would be accomplished through a timber sale that can be successfully offered to the market place.

- To manage early to mid-seral stands in RR LUA (RMP pp. 9-15) so that:
  - ✓ Growth of trees can be accelerated to restore large conifers to Riparian Reserves (RMP p. 7);
  - ✓ Habitat (e.g. coarse woody debris, snag habitat, in-stream large wood) for populations of native riparian-dependent plants, invertebrates, and vertebrate species can be enhanced or restored (RMP p. 7);
  - ✓ Structural and spatial stand diversity can be improved on a site-specific and landscape level in the long term (RMP p. 11, D-6).

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

2.0 Alternatives

2.1 Alternative Development

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

2.2 Alternative 1 (Proposed Action)

This project consists of conducting density management on approximately 304 acres of 40 to 50 year old stands within LSR and RR LUAs. This project would occur through a timber sale (K-Line LSR Enhancement). Approximately 304 acres would be thinned to a variable density (basal area ranging from 80 to 120 sq. ft/acre). Approximately 5% of the treatment area would have gaps (approximately 15, one acre patch cuts) created and approximately 2% of the treatment area would have clumps (approximately ¼ acre untreated areas) created. The intent of the proposed action is to create stand structural diversity and to produce a timber sale to be offered in fiscal year 2007. Trees would be skyline yarded on approximately 83 acres and ground based yarded on approximately 221 acres. New road construction, reconstruction, road renovation and road decommissioning of new and reconstructed roads over which timber hauling would occur are also a part of the proposed action.

2.2.1 Connected Actions

1. **Road Work**: Road construction of approximately 5700 feet and road reconstruction of approximately 300 feet would occur near ridge top locations. All of the road construction and reconstruction would be surfaced with an approximate 6"-8" depth of pit run rock. An underground high voltage cable located adjacent to roads 8-7-6.2 and 7-7-31 would be located prior to road and drainage structure work. Following harvest, all of the new construction and reconstruction would be decommissioned and blocked to vehicular traffic. Drain dips would be installed where cross drainage is necessary. Within existing roads, spot rock application may occur and drainage structure replacement would occur on approximately 4 cross drains and/or stream crossings. Cut and fill slopes adjacent to drainage structure replacements would be grass seeded and riprap would be placed as needed. New culverts installed would meet 100 year flood design criteria.

2. **Fuels Treatments**: Fuel treatment strategies would be implemented on portions of the project areas. Strategies would include directional falling (to keep slash away from fuel breaks), followed by a reduction of surface fuels in order to reduce both the intensity and severity of potential wildfires in the long term. Fuels reduction may be accomplished by burning of slash piles, by machine processing of slash on-site, or by a combination of these techniques. In order to mitigate fire risk, the area would be monitored for the need of closing or restricting access during periods of high fire danger. During the closed fire season the first year following harvest activities, while fuels are in the "red needle" stage, the entire area would be posted and closed to all off road motor vehicle use.

3. **Skid Trail Construction**: Existing skid trails would be utilized as much as possible. Constructing new skid trails would be avoided, where possible. New skid trail construction would follow the project design features described in section 2.2.2. Some main skid trails may be used as haul roads depending on harvest equipment used. This type of haul road would be restricted to the maximum width of 15 feet.

4. **Blocking Skid Trails**: After logging operations, skid trails would be waterbarred and grass seeded to mitigate soil erosion, reduce noxious weed infestation and help accelerate the return of native vegetation.

5. **Coarse Woody Debris (CWD) Creation**: Coarse woody debris enhancement would be achieved by following strategy #2 as described in the LSRA (See Table 1). This strategy serves as a guideline used in consideration with site specific factors (e.g. stand age, adjacent landscape conditions, subsequent treatment possibilities) for development of CWD prescriptive treatments outlined in Table 1. New inputs of CWD would be achieved by: indirect harvest activities (e.g. breakage, limbs and tops, trees felled but not harvested), post-harvest wind throw, bark beetle kill in response to new accumulations of slash and wind throw, and post-harvest CWD creation.

Table 1: Coarse Woody Debris prescription within the K-Line LSR Enhancement Project

Part A. Current CWD conditions. [1]

Proposed Unit	Down Wood Volume. [2]		Snags per Acre by Size Class. [3]			
	CF/acre	% DC4+5	7-10"	11-19"	20" +	Total
31A	820.4	95.9	8.1	2.7	0.7	11.5
31B	5042.6	81.9	8.4	7.5	0.6	16.5
31C, 31D	2755.1	86.0	12.7	5.5	0.6	18.8

Part B. Proposed CWD Prescriptions.

Proposed Unit	Prescription Objective [4]	Desired Input [5]	
		Snags	Down Logs
31A	Input of CWD should balance the need to boost existing low volume of logs and few legacies, with limitations on availability of larger stem sizes within stand.	4	2
31B	Minimal input of hard snags/logs needed, since existing CWD volume is very high.	2	1
31C, 31D	Modest input of hard snags/logs needed, since existing CWD volume and total snags numbers are high.	2	2

1) CWD data comes from stand exam surveys where down logs were counted along transects and the number of standing snags were counted at fixed plots.
2) Down log volume is reported in cubic-feet per acre, and the % of that volume that exists in advanced decay classes (decay class 4 and 5).
3) Snags are reported in size classes based on diameters at breast height.
4) All prescription objectives generally follow Strategy # 2 from LSR Assessment (page 97). The general goal is to balance both long-term and short-term needs for CWD by adding some new material now and to let residual trees grow larger for future CWD recruitment.
5) Desired Input is expressed as trees per acre created in the units. Harvest activities (intermediate supports, stand damage, limbs and tops, felled but retained logs) and post-harvest processes (wind throw, bug kill, etc.) would be evaluated within 5 years of harvest action and these inputs would be considered prior to creating additional CWD.

6. **Special Forest Products**: Special forest product permits would be available by permit before and after harvest operations as appropriate for LSR and RR LUA lands in this portion of the Marys Peak Resource Area.

2.2.2 Project Design Features

The following is a summary of the design features that reduce the risk of effects to the affected elements of the environment described in EA section 3.2.

General

All logging activities would utilize the Best Management Practices (BMPs) required by the Federal Clean Water Act (as amended by the Water Quality Act of 1987) (RMP Appendix C pp. C-1 through C-10).

Table 2: Season of Operation/Operating Conditions

Season of Operation or Operating Conditions	Applies to Operation	Objective
During periods of low tree sap flow, generally July 15-April 15	Yarding outside of road right of ways (cable)	Protecting the bark and cambium of residual trees
During periods of low precipitation, generally May 1-October 31	Road construction/reconstruction	Minimize soil erosion
During periods of low soil moisture, generally July 15-October 15	Ground based yarding (Tractor)	Minimize soil erosion/compaction
During periods of low soil moisture, generally June 15-October 31,	Ground based yarding (Harvester/Forwarder)	Minimize soil erosion/compaction
July 1 to August 31	In-stream work period (culvert installation and/or removal)	Minimize soil erosion/stream sedimentation
During periods of low precipitation, generally May 1-October 31	Timber Hauling	Minimize soil erosion/stream sedimentation

Project Design Features by RMP Objectives

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

- Ground based yarding with either crawler tractors or harvester/forwarders would take place generally on slopes less than 35% in Units 31A-31D.
- Harvester/forwarder use would require that logs be transported free of the ground. The equipment would be either rubber tired or track mounted, and have rear tires or tracks greater than 18 inches in width. Skid trails would be spaced approximately 60 feet apart and be less than 15 feet in width. Logging debris would be placed in skid trails in front of equipment to minimize the need for machines to operate on bare soil.
- Crawler tractor use would require utilization of pre-designated skid trails spaced approximately 150 feet apart where they intersect boundaries and utilize existing skid trails as much as practical.
- Waterbars would be constructed where they are determined to be necessary by the Authorized Officer.

- All locations where mineral soil is exposed (roads to be constructed, reconstruction, cat/skid roads and landings, culvert replacements) would be sown with Oregon Certified (blue tagged) red fescue (*Festuca rubra*), and/or sown with a wildlife vegetation mix and applied at a rate equal to 40 pounds per acre or sown/planted with other native species as approved by the resource area botanist.
- In the skyline yarding area, one end suspension of logs would be required over as much of the area as possible to minimize soil compaction, damage to reserve trees, and disturbance. Yarding corridors would average approximately 150 feet apart where they intersect boundaries and be 15 feet or less in width. Lateral yarding up to 75 feet from the skyline using an energized locking carriage would be required.
- During periods of rainfall when water is flowing off of road surfaces, the contract administrator may restrict log hauling to minimize water quality impacts, and/or require the Purchaser to install silt fences, barkbags or apply additional road surface rock.

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

- Stream protection zones (SPZs) would be established along all streams and identified wet areas within the harvest area. These zones would be a minimum of approximately 50 feet from the high water mark.
- 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 all SPZs within the harvest area.

To protect and enhance stand diversity and wildlife habitat components:

- Priorities for tree marking would be based on Marking Guidelines (see Appendix 3).
- Approximately fifteen patch cuts would be created within the density management areas by cutting most trees. The patch cuts would be approximately one acre in size and would most likely be planted with a mix of western hemlock, noble fir and western red cedar. All patch cuts located within 100 feet of streams would be less than ¼ acre. Additional trees would be left adjacent to the patch cuts.
- Except in yarding corridors/skid trails and patch cuts, species diversity would be maintained by reserving all trees (merchantable and non merchantable) other than Douglas-fir and western hemlock.
- All open grown "wolf trees", 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 snags and additional trees would be cut around seedlings and understory trees in order to increase spacing variability. 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 K-Line Late Successional Reserve Enhancement Project EA Analysis File (NEPA file).
- 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 diameter breast height outside bark (DBHOB) or larger.

Incidentally felled topped trees (ie. tailtrees, 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 on a per treatment unit basis.

- Further enhancement and monitoring of CWD would occur within the proposed project as described in Table 1.
- The western white pine tree clump area located in Unit 31C would be protected by reserving a buffer of trees around it. After logging is completed, adjacent trees would be felled to release the pine.
- Five noble fir trees selected for their superior genetic quality would be protected, by reserving adjacent trees around them.
- Conifer species such as western hemlock, noble fir and western red cedar would be planted in areas large enough to support a conifer understory.

To reduce fire hazard risk and protect air quality:

- Light accumulations of debris cleared during road construction and along roads that would remain in drivable condition following the completion of the project would be scattered along the length of rights-of-way.
- Large accumulations of debris on landings and along existing roads that would remain in drivable condition would be machine piled. At least 90% of the slash in the ¼" to 6" diameter range within 20 feet of the road edge would be piled for burning.
- Debris accumulations within the patch cuts would be machine and/or hand piled. At least 75% of the slash in the ¼" to 6" diameter range would be piled for burning.
- All piles would be located at least ten feet away from reserve trees and snags. Larger piles would be preferable over small piles. Wind rows would be avoided unless approved in advance by the Authorized Officer.
- During the late summer before the onset of fall rains, all machine and hand piles to be burned, would be covered at least 80% with 4 mil polyethylene plastic.
- All burning would occur under favorable smoke dispersal conditions in the fall, in compliance with the state Smoke Management Plan (RMP pp. 22, 65).

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

- Site management of any Federal or Oregon State Threatened and Endangered (T&E) or Bureau Special Status (SS) botanical and fungal species found as a result of additional inventories would be accomplished in accordance with, BLM Manual 6840- *Special Status Species Management*. Site management of Survey and Manage Species would be accomplished in accordance with the *Record of Decision and Standards and Guidelines for Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (S&M ROD, January 2001) and the *Final Supplemental Environmental Impact Statement For Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (S&M FSEIS, November 2000) and results of the Annual Species Review (ASR) 2001 (BLM IM OR 2002-064), 2002 ASR (BLM IM OR 2003-050) and 2003 ASR (BLM IM OR-2004-034). This EA is in compliance with the 2001 ROD as stated in Point (3) on page 14 of the January 9, 2006, Court order in Northwest Ecosystem Alliance et al. v. Rey et al. (K-Line EA Appendix 4 – Compliance with Survey and Manage Direction).

- Fungi protection zones would be created to provide protection to the following Bureau SEIS (survey and manage) special attention fungi species; *Rickenella swartzii*, *Cudonia monticola*, *Gomphus kaufmannii* and *Ramaria cyaneigranosa*. All of the known sites would be deferred from any timber harvesting activity which would minimize any soil disturbance and protect the known site micro-climate.
- Adequate protection buffers would be provided to prevent accumulation of sedimentation from logging activities in all areas containing *Sphagnum* moss.
- The Resource Area Biologist and/or Botanist would be notified if any Threatened and Endangered and Bureau Special Status Plants and Animal species are found occupying stands proposed for treatment during project activities. All of the known sites would be withdrawn from any timber harvesting activity.

To protect Cultural Resources:

The project area occurs in the 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.

2.3 No Action Alternative

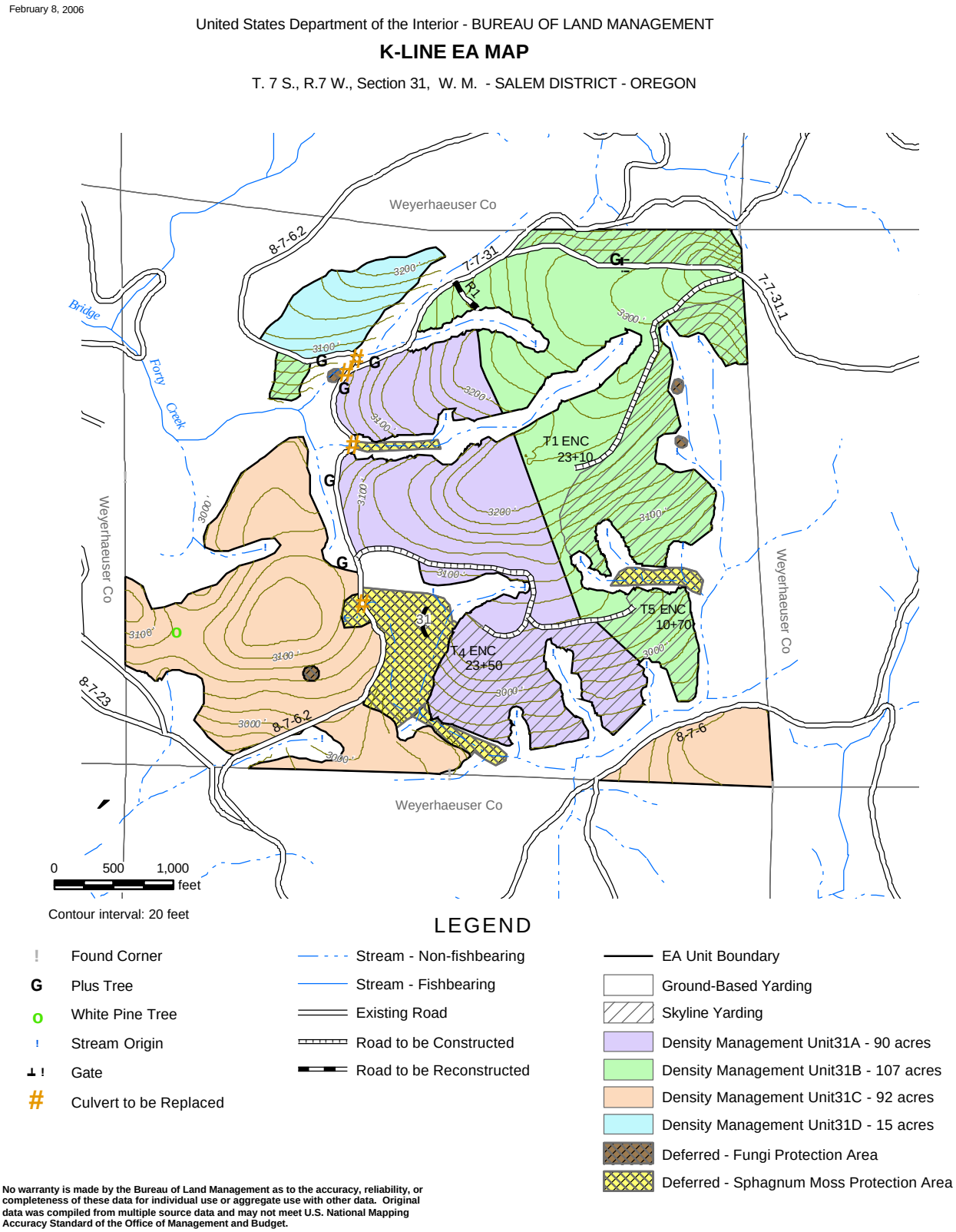
The BLM would not implement the action alternative at this time. This alternative serves to set the environmental baseline for comparing effects to the proposed action.

2.4 Alternatives Considered but not Analyzed in Detail

Road construction spurs limited to 200 feet distance: An alternative that would limit the amount of new spur road construction distances to 200 feet would have reduced the density management treatment area from the proposed 304 acres to approximately 151 acres. The area eliminated from density management consisted of approximately 78 acres of skyline yarding and 75 acres of ground based yarding. These areas would become inaccessible to harvest operations due to adverse topography features and exceedingly high ground based logging costs. This alternative would not have met the purpose and need as this reduction would have severely reduced the development, acceleration, and enhancement of mid-seral forest toward late-successional forest conditions. Consequently, this alternative was not analyzed in detail.

Restoration Activities without Commercial Timber Removal: An alternative that would have only included restoration activities (CWD creation) and no commercial timber removal within the inaccessible areas was considered. This alternative was not analyzed in detail because solely creating CWD would be ineffective for meeting the purpose and need of implementing silvicultural treatments inside Late-Successional and Riparian Reserves that are beneficial to the creation of late successional habitat, accelerating the growth of trees in order to restore large conifers to Riparian Reserves and improving structural and spatial stand diversity on a site-specific and landscape level in the long term.

Map 2: Map of the Action Alternative



3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS - COMMON TO ALL PROJECT AREAS

3.1 Identification of Affected Elements of the Environment

The interdisciplinary team reviewed the elements of the human environment, required by law, regulation, Executive Order and policy, to determine if they would be affected by the proposed action. Table 3 ("Critical Elements of the Human Environment") and Table 4 (Other Elements of the Environment) summarize the results of that review. Affected elements are **bold**. All entries apply to the action alternative, unless otherwise noted.

Table 3: Review of the "Critical Elements of the Human Environment" (BLM H-1790-1, Appendix 5)

"Critical Elements Of The Human Environment"	Status: (i.e., Not Present , Not Affected, or Affected)	Does this project contribute to cumulative effects? Yes/No	Remarks
Air Quality (Clean Air Act)	**Affected**	**No**	**Burning of slash piles would take place during favorable weather conditions in compliance with ODEQ regulations and Oregon Department of Forestry guidance, ensuring that impacts to the airshed would not exceed the established standards. Addressed in text (EA section 3.2.6 & K-Line Timber Sale Proposal Fuels Report pp. 1-4)**
Areas of Critical Environmental Concern	Not Present	No	
Cultural Resources	Not Affected	No	Cultural resource sites in the Coast Range, both historic and prehistoric, occur rarely. The probability of site occurrence is low because the majority of BLM managed Coast Range land is located on steep upland mountainous terrain that lack concentrated resources humans would use. Post-disturbance inventory would be completed on slopes less than 10%.
Energy (Executive Order 13212)	Not Affected	No	There is no known energy resources located in the project area. The proposed action would have no effect on energy development, production, supply and/or distribution.
Environmental Justice (Executive Order 12898)	Not Affected	No	The proposed action is not anticipated to have disproportionately high and adverse human health or environmental effects on minority populations and low-income populations.
Prime or Unique Farm Lands	Not Present	No	

"Critical Elements Of The Human Environment"		Status: (i.e., Not Present , Not Affected, or Affected)	Does this project contribute to cumulative effects? Yes/No	Remarks
Flood Plains (Executive Order 11988)		**Affected**	**No**	**Four culverts would be installed on three perennial and one intermittent streams (see Map #2), thereby disturbing natural stream banks and floodplain access. Addressed in Text (EA section 3.2.2 & Soils/Hydrology Report pp. 1-16)**
Hazardous or Solid Wastes		Not Present	No	
Invasive, Nonnative Species (plants) (Executive Order 13112)		**Affected**	**No**	**Addressed in text (EA section 3.2.1 & Botanical Report K-Line Late Successional Reserve Enhancement pp. 1-7).**
Native American Religious Concerns		Not Affected	No	No Native American religious concerns were identified during the public scoping period.
Threatened or Endangered (T/E) Species or Habitat	Fish	Not Affected	No	Upper Willamette River (UWR) steelhead trout are approximately 7 miles downstream in Rickreall Creek and UWR Chinook salmon are approximately 24 miles downstream in Rickreall Creek. A determination of no effect to listed ESA fish and their habitat was based on the distance upstream of the project area from their habitat (approximately 7 and 24 miles downstream) and project design criteria that includes no harvest activity within SPZs, dry season hauling and post-project leave tree densities of 46-80 trees per acre. Addressed in text (EA section 3.2.4 & K-Line Density Management Project Environmental Assessment Fisheries Report pp. 1-6).
	Plant	Not Present	No	
	Wildlife (including designated Critical Habitat)	**Affected**	**No**	**Addressed in text (EA section 3.2.5 & Biological Evaluation pp. 1-10).**
Water Quality (Surface and Ground)		**Affected**	**No**	**Addressed in text (EA section 3.2.3, Soils/Hydrology Report pp. 1-16 & Cumulative Effects Analysis pp. 1-11).**
Wetlands/Riparian Zones (Executive Order 11990)		Not Affected	No	Wetlands and Riparian zones (i.e., near stream areas with actual riparian vegetation or characteristics) would be designated as SPZs and buffered out of the treatment areas. (K-Line LSR Enhancement Project Silvicultural Prescription: Including Upland and Riparian Reserves in NEPA file).
Wild and Scenic Rivers		Not Present	No	
Wilderness		Not Present	No	

Table 4: Review of Other Elements of the Environment

Other Elements of the Environment		Status: (i.e., Not Present, Not Affected, or Affected)	Does this project contribute to cumulative effects? Yes/No	Remarks
Coastal zone		Not Affected	No	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.
Fire Hazard/Risk		**Affected**	**No**	**Addressed in text (EA section 3.2.6 & Fuels Report pp. 1-4)**
Other Fish Species with Bureau Status and Essential Fish Habitat		**Affected**	**No**	**Coastal cutthroat trout are considered a special status species by the BLM. Addressed in text (EA section 3.2.4 & K-Line Density Management Project Environmental Assessment Fisheries Report pp. 1-6).**
Land Uses (right-of-ways, permits, etc)		Not Affected	No	Existing right-of-way agreement (RWA S-805) with Weyerhauser Company.
Late Successional and Old Growth Habitat		Not Present	No	
Mineral Resources		Not Present	No	
Recreation		Not Affected	No	Dispersed use by recreationist (hunting). The area is isolated and is behind locked gates on all access routes.
Rural Interface Areas		Not Present	No	
Soils		**Affected**	**No**	**Addressed in text (EA section 3.2.2 & Soils/Hydrology Report pp. 1-16)**
Special Areas outside ACECs (Within or Adjacent) (RMP pp. 33-35)		Not Present	No	
Other Special Status Species / Habitat (including Survey and Manage)	Plants	Not Affected	No	Addressed in text (EA section 3.2.1 & Botany Report - K-Line Late Successional Reserve Enhancement pp. 1-7)
	Wildlife	**Affected**	**No**	**Addressed in text (EA section 3.2.5 & Biological Evaluation pp. 1-10)**
Visual Resources		Not Affected	No	Project is located within VRM Class III & IV land. Changes to the landscape character are expected to be low and comply with Class III & IV guidelines.
Water Resources – Other (303d listed streams, ODEQ 319 assessment, Downstream Beneficial Uses; water quantity, Key watershed, Municipal and Domestic)		**Affected**	**No**	**Addressed in text (EA section 3.2.3, Soils/Hydrology Report pp. 1-16 & Cumulative Effects Analysis pp. 1-11)**

Other Elements of the Environment	Status: (i.e., Not Present , Not Affected, or Affected)	Does this project contribute to cumulative effects? Yes/No	Remarks
Wildlife Structural or Habitat Components - Other (Snags/CWD/ Special Habitats, road densities)	**Affected**	**No**	**Addressed in text (EA section 3.2.5 & Biological Evaluation pp. 1-10)**

3.2 Affected Environment and Environmental Effects

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

3.2.1 Vegetation

(IDT Reports incorporated by reference: K-Line Late Successional Reserve Enhancement Project Silvicultural Prescription Abstract: Including Upland and Riparian Reserves pp. 1-8, K-Line Late Successional Reserve Enhancement Project Silvicultural Prescription: Including Upland and Riparian Reserves pp. 1-21, K-Line Late Successional Reserve Enhancement Botanical Report pp.1-7, and Abstract K-Line Botany pp.1-4)

Affected Environment

The current stands resulted from a large wildfire and subsequent salvage logging approximately 50 years ago, and were likely left to seed in. No pre-commercial thinning or other intensive management practices have occurred in these stands.

The project area consists of young densely stocked managed stands, composed of Douglas-fir, western hemlock, and scattered large noble firs. A small number of western red cedar and hardwoods occur mostly near streams. The stands are undergoing mortality due to competition. There are scattered pockets of understory conifers (30 to 50 trees per acre over the whole stand) and most of these are Douglas-fir with a few western hemlock and fewer noble fir. There are a few areas with larger somewhat older residual live trees which presumably either survived the fire and avoided salvage logging, or established before the majority of the trees. A few scattered large snags, and down wood in older decay classes (3, 4 and 5) occur throughout the stand (Table 1). Fresh down wood is mostly in the form of snapped out tops from recent wind storms.

Shrub species consists mostly of dense to scattered rhododendron, depending on light conditions, and some scattered vine maple, salal, sword fern and Oregon grape. Areas under dense canopy have very little understory shrub vegetation while areas under canopy openings are densely stocked with shrub species, mostly rhododendron.

The stands are located in a harsh environment, with heavy precipitation, often in the form of snow in the winter. As a result there are many Douglas-fir with snapped out tops, many of them dead, presumably from wind blowing on trees heavy with snow/ice. No evidence of insects or disease is evident in the stand, although root disease and Douglas-fir bark beetle are endemic to Oregon Coast Range conifer stands and probably affect a small portion of trees in the project area.

Federal and Oregon State Threatened/Endangered, Bureau Special Status and Bureau SEIS (Survey and Manage) Special Attention Botanical and Fungal Species:

All federal and Oregon State threatened and endangered, Bureau special status and SEIS (survey and manage) special attention species included in the Marys Peak botanical report, appendix A, or otherwise listed in Table 1-1, annual species review (December 2003) were surveyed for either on the ground or through pre-project clearances such as known site databases and examination of habitat requirement for individual species.

Inventory of the project area for Federal and Oregon State threatened and endangered and Bureau special status and Bureau SEIS (survey and manage) special attention vascular plant, lichen, bryophyte and fungal species were accomplished through pre-field reviews and field intuitive controlled surveys, in accordance with survey protocols for each specific groups of species.

There are no "known sites" of any Federal or Oregon State listed threatened or endangered or Bureau special status or SEIS (survey and manage) special attention vascular plant, lichen or bryophyte species within the project area nor were any found during subsequent surveys.

Pre-project fungi clearances are only required for *Bridgeoporous nobillisimus*. *Bridgeoporous nobillisimus* was not found during subsequent surveys. Pre-project clearances are not required for all other fungi species because they are considered "not practical to survey for". However, the following SEIS (survey and manage) special attention fungi species were found within the proposed project area during subsequent surveys; *Rickenella swartzii*, *Cudonia monticola*, *Gomphus kaufmannii* and *Ramaria cyaneigranosa*. There are no other known sites of any Federal or Oregon State listed threatened or endangered or Bureau special status or SEIS (survey and manage) special attention fungi species within the project area.

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

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

Environmental Effects

3.2.1.1 Alternative 1 (Proposed Action)

Development of stand structure and individual tree characteristics desirable for attainment of composition and structural diversity objectives in the *LSRA* and the Aquatic Conservation Strategy would be accelerated.

Trees would be removed in a variable spacing; providing both openings for understory tree/shrub development and areas of higher density. This would provide habitat for a wider variety of species than a dense uniform stand. The proposed action would increase the amount of light penetrating the canopy and promote growth and development of vegetation found at mid canopy and ground levels. In the short term a more complex understory would develop consisting of more shrub species which are important habitat components for insects, a major food source for fish, amphibians and birds. Understory initiation of shade tolerant conifers associated with canopy layering would be promoted in areas of increased light over the long term.

Residual trees would increase in diameter and crown depth/width. Limb diameter on large limby trees would be maintained by releasing those trees to an open grown condition. The long-term results of density management would be larger average DBHOB and deeper crowns at any given age, compared to the no treatment option. Average stand diameters 30 years in the future in the treated stands would be 25 to 30% larger than if the stands were not thinned. Average stand crown ratios, which is an indicator of wind firmness and crown depth, would average 30% higher. Trees grown in more open conditions become more wind firm than those in very dense stands, both because individual trees experience more wind as they develop and because trees with less competition maintain their live crowns longer, giving them a lower center of gravity and decreasing their height/diameter ratios. Average crown ratios of the treated stands immediately after thinning increase by approximately 18 to 40%.

The proportion of minor conifer species would be increased from the current 10 to 30% to 50 to 75% by targeting Douglas-fir as the primary species to remove. There would be a short term elevated risk of blowdown which would be minimized by selecting leave trees with deep healthy crowns and grouping them where possible. Additionally, higher basal areas would be maintained on ridges and more trees could be removed from lower, more sheltered slopes.

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 creation of additional snags and down wood subsequent to the proposed treatment. Guidelines provided by the Westside Forest Insect and Disease Technical Center would be followed to minimize this risk.

Any ground disturbing activity may lead to an increase in the noxious weeds known from within the project area. All road construction, reconstruction, renovation, decommissioning, timber falling and yarding operations would disrupt areas of duff and expose mineral soil. Non-native species may become established in any exposed mineral soil areas. These non-native species often persist for several years but soon decline as native vegetation increases within the project areas.

<u>Federal and Oregon State Threatened/Endangered, Bureau Special Status and Bureau SEIS (Survey and Manage) Special Attention Botanical and Fungal Species:</u>

Since there are no known sites for any federal or Oregon State threatened or endangered or Bureau special status or Bureau SEIS (survey and manage) special attention vascular plants, lichen or bryophyte species within or adjacent the project area, known sites would not be affected.

All of the following fungi SEIS (survey and manage) special attention species known sites, have been removed from any timber harvest or ground disturbing activities and would be protected; *Rickenella swartzii*, *Cudonia monticola*, *Gomphus kaufmannii* and *Ramaria cyaneigranosa*. There are no other known sites of any federal or Oregon State threatened or endangered or Bureau special status or Bureau SEIS (survey and manage) special attention fungi species within the project area.

The implementation of this project would not directly affect any federal or Oregon State threatened or endangered or Bureau special status or SEIS (survey and manage) special attention vascular plant, lichen, bryophyte or fungi species known sites since there are no known sites of any of these species within the timber harvest area. The implementation of this project would not contribute to the need to list of any of the species included in appendix A of the botany report or otherwise listed in Table 1-1, annual species review (December 2003).

Invasive Species: (Noxious weeds, Invasive Non-native Species):
This project would be in compliance with the Mary's Peak integrated non-native plant management plan. The risk rating for the long-term establishment of noxious weed species and consequences of adverse effects on this project area is low and adverse effects from noxious weeds within the project area are not anticipated for the following reasons: The K-Line project design feature of revegetating exposed soil areas by sowing with Oregon Certified (blue tagged) red fescue (*Festuca rubra*), and/or sowing with a wildlife vegetation mix and applied at a rate equal to 40 pounds per acre or sowing/planting with other native species as approved by the resource area botanists are expected to abate the establishment of noxious weeds.

3.2.1.2 Cumulative Effects:

There would be no cumulative effects to the vegetation, as the effects from the project would be local, and there would be no other uses affecting this resource. However, wildlife habitat enhancement on federal land may provide greater habitat connectivity function over adjacent areas.

3.2.1.3 No Action Alternative

There would be no disturbance and consequently no microclimate changes in the Riparian Reserves. There would be no short term elevated risk of bark beetle infestation. However, as stand health is compromised due to high densities, risk of long term bark beetle infestation is increased, especially during extended periods of drought. Stand mortality due to competition would increase, creating increased amounts of small diameter terrestrial and instream down wood, and snags.

Trees would continue at their present rate of growth, slowing as the canopy closes and competition for light becomes more intense. Crown ratios would decrease at a faster rate compared to proposed action. Wind firmness and individual tree stability would decrease as crown ratios decrease. Risk of catastrophic consequences due to wildfire may increase. Densely stocked stands with subsequent large numbers of small snags and CWD burn more readily and are more subject to crown fires than stands growing at lower densities.

The canopy would remain closed, allowing little light to penetrate to the ground. No substantial understory would develop within the next 45 years and beyond without density management. Natural disturbance would be the agent for creation of stand structural diversity. The most likely agent for this disturbance would be wind, which would create openings in patches. It is unknown how long it would take for natural disturbance to create the structural and species diversity needed in this watershed, but it is expected, based on experience and a considerable body of research, that this diversity would take considerably longer to develop than if the proposed treatment were implemented. Nutrients would not be removed from the site. Without any new human caused disturbances in the proposed project area the established noxious weed populations would remain low.

3.2.2 Soils

(IDT Reports incorporated by reference: Hydrology/Soils Specialist Report Abstracts K Line Timber Sales pp. 1-11, Hydrology/Soils Specialist Report K Line Timber Sale pp. 1-16)

Affected Environment

The predominant soil series, in and around the project area, are the Valsetz and Cruiser series, with a small section of Unit 31C mapped as Yellowstone Series. Due to the rocky nature and high infiltration of these soils, they are at a greater risk of nutrient loss from top soil displacement than to soil compaction. The site's high amounts of precipitation and fast weathering rates results in the rapid leaching of nutrients through the soil.

A stand replacing wildfire during the summer of 1945, followed by salvage logging in at least portions of the project area, likely removed much of the existing available organic matter. Since the 1950s, nutrient recovery has been slow. Fifty year old stands on the site exhibit relatively slow growth rates and there is little understory development.

Moderately compacted soils still exist in scattered skid trails that date back to the original tractor logging that was done in the proposed project area in the 1940s & 1950s. Less than 5% of the proposed project area is occupied by distinguishable skid trails on 1956 air photos. High weathering rates has led to the partial recovery of most skid trails in the project area, however, they are still devoid of substantial vegetation. This is presumably due to the lack of nutrient laden top soil on the skid trails, than to soil compaction. Trees growing on piles of displaced topsoil adjacent to skid trails or root pockets show substantial growth and vigor compared to their cohorts.

A few pre-existing skid trails remain relatively compacted and have intercepted surface and near-surface flow. According to data obtained from the Natural Resources Conservation Service (NRCS), soils in the project area have a slight to moderate hazard of off-road or off-trail erosion and are moderately suited for natural surfaced roads (skid trails).

Project areas proposed for new road construction and haul have a "severe" limitation affecting haul road construction and log landings due to slope and a restrictive layer. However, the "suitability" for log landings is rated as "moderate" with a "moderate" hazard of soil rutting (NRCS 2005).

Slopes in the vicinity of the project area average 23% with slopes in the proposed units reaching a maximum of 50%. There was no evidence seen in the project area of any recent mass movement, slump, or persistent creep. The existing rocked road surfaces within the proposed project area are moderately stable. A few road segments along the haul route show signs of surface erosion where vehicle traffic occurs during wet weather and/or where surface water accumulates and runs down the compacted road surface.

Environmental Effects

3.2.2.1 Alternative 1 (Proposed Action)

Compaction and disturbance/displacement of soil:

Skyline Yarding: Preliminary logging plans estimate no more than 17 acres would be cleared of timber for yarding corridors. Yarding corridors could compact about 3.5% of the skyline units or a total of approximately 3 acres, (as a percentage of the total project area approximately 0.9%). Impacts from skyline yarding usually result in light compaction of a narrow strip less than 4 feet in width. Skyline yarding would occur on steeper areas of the project, with deep and moderately deep soils. The high rock component of these soils should buffer soil compaction somewhat; however, due to the steeper slopes in the skyline units, they are more susceptible to surface ravel and erosion.

Ground Based Yarding: Compaction is defined as a physical change in soil properties that result in an increase in soil bulk density and a decrease in porosity. The degree of compaction ("light", "moderate", or "heavy") is relative to the site and refers to the amount of bulk density increase and the depth of affected soil. Impacts would vary depending on whether a harvester/forwarder system or crawler tractors are used, how dry the soils would be when heavy equipment operates on them, and how deeply covered with slash the soils in the skid trails would be. In tractor skid trails, a moderate amount of top soil displacement and moderate to heavy soil compaction could occur depending on the amount of use. In harvester/forwarder skid trails, soil displacement would be minimal and soil compaction would be light to moderate.

For crawler tractor systems, soil impacts would be 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. If yarding is done using crawler tractors for all the proposed ground-based units, the percentage of total tractor unit area impacted by surface disturbance and soil compaction would be approximately 6 to 8% (approximately 14-19 ac.), or approximately 4.4% of the entire project area. This is within RMP guidelines for limiting the areal extent of compaction to no more than 10 percent of the ground-based unit (Appendix C-2).

If harvester/forwarder systems are used, harvest roads would be expected to result in light to moderate compaction in two discontinuous, narrow strips less than 3 feet in width. If a harvester/forwarder system is used for the entire proposed ground-based area, the percentage of total ground based unit area impacted by surface disturbance and soil compaction as a result of skid trails would be approximately 2 to 5% (approximately 5-12 ac.). When sufficient slash and duff is maintained, minor top soil loss or soil displacement should occur.

Some of the potentially impacted acreage listed above, includes already existing skid trails from previous logging in the 1920 to 1950s period. Where practical, portions of these existing roads would be used for harvest roads for this project. As a result, the amount (acreage) of new or additional harvest impacts would be less than the totals listed above.

Much of the project area has been impacted by past tractor yarding, and numerous skid trails can be found throughout most of the units proposed to be ground-base yarded. Blocking skid trails by water-barring and grass seeding would promote out-slope drainage and prevent water from accumulating in large quantities, running down the road surface, and causing erosion. After several seasons, the accumulated litter fall on the road surfaces would further reduce surface erosion potential.

Landings: A maximum of 29 landings could be needed to harvest the proposed units. Approximately 5 of these landings would be at the terminus of yarding corridors, with the remainder of landings located along existing roads. The landings at the ends of roads could range from 0.07 to 0.1 acre. The amount of soil surface disturbance and compaction on these landings could range from moderate to severe, depending on how much excavation is required to level/construct the landing and how often equipment operates/turns around on the site. For the approximate 24 landings located along existing roads, the additional area adjacent to the road that would be needed is estimated to be approximately 1200 sq. ft. per landing. For the entire proposed project area this amounts to a total of 0.7 acres for all road-side landings (as a percentage of the total project area less than 0.3%). The road surface is already assumed to be severely compacted. The additional area cleared for these landings may experience little to moderate compaction, as heavy equipment would likely operate on the existing road prism.

Some soil displacement would occur at all landing sites due to vegetation clearing and excavation. The loss of top soil could be minimized by maintaining slash/duff on the soil surface where possible and rehabilitating the sites (seeding, pull back, planting, etc.) after use. Soil displacement would be expected to remain localized to the sites, it is not anticipated that the proposed actions would result in extensive soil loss or erosion over the site or in sediment leaving the site.

Timber Haul: With timber hauling seasonally restricted to periods when no water is flowing on road surfaces, the amount of sediment produced from roads and entering streams would be small.

Roads: Constructing/reconstructing approximately 6000 feet of road would result in loss of topsoil and compaction of sub-soil on approximately 2.2 acre (about 0.7% of the total proposed project area). The area is currently forested land that would be converted to non-forested. The roads to be constructed would be on moderate topography (grades of approximately 3 to 10%), so the total width of the clearings would be expected to be around 22 feet. These narrow clearings would have a minimal effect on overall tree spacing and stocking.

All of the new construction would be decommissioned following harvest, so some recovery back to a forested condition would occur in the area over time.

Road renovation would result in no change in the amount of current non-forest land. Drainage structure improvements and/or replacement would occur on approximately 4 cross drains and/or stream crossings.

These improvements would improve drainage and road surface conditions, resulting in less road surface erosion into the surrounding area and streams. The improvement work would be expected to result in some minor short term roadside erosion; this would be most likely to occur when the established vegetation in the ditch and culvert catchment areas would be removed in affiliation with the cleaning, reshaping, or culvert installment operations. Litter-fall accumulations and the growth of vegetation generally re-establish within one-two seasons and erosion rates would be expected to return to very low levels thereafter. The addition of extra cross-drain culverts and the road surface reshaping would reduce the volume of water flowing on the road surfaces and could also result in less future erosion.

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

CWD Creation: Coarse woody debris generated by logging slash, windthrow, and/or bark beetle infestation left on site following operations would help cover the soil surface and limit surface erosion. Girdling or overtopping trees for snag creation would not be likely to measurably impact soil resources. Felling trees for CWD would cause minor soil displacement and compaction where the tree falls on the ground. Coarse woody debris would be cut and left in place and the impacts would be of no greater extent than a natural tree fall.

The project meets Salem District RMP standard and guideline of 10 percent as the maximum acceptable level of aerial extent for soil disturbance/compaction.

Site Productivity:

Logging: Because of the current low soil productivity of the project area, the site is highly susceptible to further reductions due to timber harvest and conventional logging systems. Some levels of "natural" nutrient depletion are resulting from the site's high elevation and extreme annual precipitation. However, there is also indication that past disturbance has removed organic biomass from the site and also that the site has been slow to "recover" from these losses. Therefore, some level of site productivity loss (from nutrient depletion) would be expected from harvest activities, regardless of the yarding method used.

For the ground-base yarding units, the effect on project site productivity for a maximum of approximately 38 acres of highly impacted ground (skid trails and landings) would be a 5% reduction in overall yield for the ground-based units; this assumes tractor yarding exclusively, as impacts from using a harvester/forwarder would be less severe.

The effect on project site productivity resulting from skyline yarding and landings, a maximum of 32 acres, would be expected to be an 8% reduction in overall yield for the proposed skyline yarding unit areas. The effect on overall project site productivity for both yarding systems would be a 6% reduction in overall yield for the entire 304 acre treatment area. These estimates represent a "worst case" scenario – assuming that all ground based corridors and landings suffer a 30% reduction in productivity and all yarding corridors and landings suffer a 20% reduction in productivity.

The estimated reduction in growth rate for trees on moderate to severely impacted areas is 15% to 30% during the first 10-20 years of growth. As trees age and become established, the negative effect on growth from soil compaction and displacement becomes less pronounced and growth rates may approach that of trees on similar, undisturbed sites. This is especially true where the area of compaction/displacement tends to be in narrow strips, as is the case with yarding corridors and small landings.

3.2.2.2 Cumulative Effects:

Because the effects of the proposed action on soils are expected to be short-term and localized, cumulative effects are not anticipated. The combined effect of each of the proposed actions (density management, road work, fuels treatments, skid trail construction, and CWD creation), would increase the overall amount of compaction and erosion in the project area. The greatest cumulative effect on the site would likely be a reduction in overall site productivity from top soil displacement, as each of these activities has the potential to remove and/or displace soil nutrients. The total extent of disturbance would be "moderate" over the longer term (with some soil recovery) and local to the project sites. There are no other known actions, aside from those described above, which would be enhanced or diminished by these proposed actions.

3.2.2.3 No Action Alternative

There would be no additional impacts to soil resources other than those described under the Affected Environment. Without road improvements (culvert replacements), some project area roads could continue to redirect surface flows, leading to soil erosion and potential sedimentation into nearby streams.

3.2.3 Water

(IDT Reports incorporated by reference: Hydrology/Soils Specialist Report Abstracts K Line Timber Sale pp 1-7, Hydrology/Soils Specialist Report K Line Timber Sale pp.1-16, Cumulative Effects Analysis for K-Line Thinning pp.1-11)

Affected Environment

The K-Line project area straddles the crest of the Coast Range with tributaries flowing towards both the coast (Upper Siletz River 5th-field watershed) and the Willamette Valley (Rickreall Creek 5th-field watershed). Tributaries draining the east side of the project flow into Rickreall Creek (Willamette River). Tributaries draining the northern and western sections of the project flow into the North Fork of the Siletz River. Neither the Upper Siletz River Watershed nor the Rickreall Creek Watershed are key watersheds.

Stream channels in the project area are primarily very small, intermittent and perennial, 1st and 2nd order headwater tributaries, associated with marshes. The total extent of marshes in the project area is approximately 21.5 acres.

These flat, open areas are defined by annually or seasonally saturated soils, resulting in the establishment of hydrophilic vegetation. Most are associated with streams meandering and braiding through them; some also contain small ponds and backwater pools.

All channels viewed in the project area are vegetatively and/or bedrock stabilized. As a result of underlying soil conditions, some channels experience discontiguous flow, periodically retreating subsurface. Surface flow in some areas of the proposed project has been intercepted by compacted skid roads. However, the majority of channels, appear functional and stable and are currently in proper functioning condition.

Oregon Department of Environmental Quality (ODEQ) Standards
The Oregon Department of Environmental Quality's (ODEQ) 1998 303d List of Water Quality Limited Streams is a compilation of streams which do not meet the state's water quality standards. The Upper Siletz River and its tributaries are not listed in the 2002 303d report. The Siletz River mainstem is 303d-listed for exceeding summer temperature standards for anadromous fish rearing, from river mile 7 to 46.8, approximately 30 miles downstream from the project area. Rickreall Creek is also 303d-listed for exceeding summer temperature standards for anadromous fish rearing, from river mile 0 to 24.9, approximately 8 stream miles from the project area.

The ODEQ also published an assessment, the 319 Report, which identifies streams with potential non-point source water pollution problems. The Siletz River is listed in the 319 Report, downstream of BLM lands, for having "moderate" general water quality conditions affecting fish, and aquatic habitat. Rickreall Creek is also listed in the 319 report for having "moderate" water quality conditions affecting fish, aquatic habitat, and drinking water supplies.

Municipal Watersheds & Beneficial Uses of Waters
The project area lies within two municipal watersheds as delineated by the Oregon Department of Environmental Quality's Source Water Assessment Plan: the City of Siletz and the City of Dallas. There are currently no Oregon requirements for BLM to meet certain standards for protecting municipal water sources. However, the proposed action should be designed to ensure that management activities do not create the need for additional water treatment beyond that required by the inherent character of the watershed or aquifer. Within each watershed, the ODEQ identified "sensitive areas" where potential contamination could occur from contamination sources and/or land use activities. The proposed new road construction in K Line would occur within and/or adjacent to these "sensitive areas".

Beneficial Uses
There are no known domestic or municipal water rights located in the project area. The closest proximity water right to the project area is the Mercer Reservoir, municipal water supply and storage, for the city of Dallas on Rickreall Creek over 7 stream miles downstream. The closest water right along the coastal tributaries is for aquatic life and recreation along the Siletz River over 10 stream miles downstream of the project area.

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

Environmental Effects

3.2.3.1 Alternative 1 (Proposed Action)

The proposed project would affect less than 0.001% of the forest cover in the Rickreall Creek watershed and 0.5% of forest cover in the Upper Siletz watershed. Because of the small percentage of forest cover being affected by this project, increases to stream flow (mean annual yield & summer base flow) caused by this action alone are unlikely to be measurable.

Increases in stream temperature as a result of this action are also unlikely; the no-treatment zones along all surface waters should maintain adequate shading, where it exists.

It is unlikely that the proposed project would lead to measurable increases in sediment delivery to streams, stream turbidity, the alteration of stream substrate composition, or sediment transport regime. Stream buffers would eliminate disturbance of streamside vegetation; no trees would be cut from the stream bank or where roots are stabilizing the stream bank.

Logging:
Skyline yarding corridors and ground-based skid trails, if sufficiently compacted, could route surface water and sediment into streams. However, several factors would limit the potential for this to occur. Even if compacted, high levels of residual slash left on yarding corridors/skid trails, could reduce runoff by deflecting and redistributing overland flow laterally to areas where it would infiltrate into the soil.

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

Because of the high rock content, project area soils are not highly susceptible to surface or deeper compaction, although some of the existing skid trails are currently routing surface runoff. In addition, SPZs in riparian areas have high surface roughness, which function to trap any overland flow and sediment before reaching streams. Ground-based yarding would occur during periods of low soil moisture with little or no rainfall, in order to minimize soil compaction and erosion.

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. The two small channels which parallel the 8-7-6.2 road, at the southern boundary of Unit 31C, are at the greatest risk of sediment input from road use. However, with timber hauling seasonally restricted to periods when no water is flowing on road surfaces, the amount of sediment produced from roads and entering streams would be small.

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

Road Work:
Road construction and reconstruction effects would be limited by restricting work to periods of low rainfall and runoff. New road construction would occur along moderate gradients (approximately 3-10%) and generally follow along contour or mid-slope. There would be no new stream crossings, however, construction would take place within riparian reserves.

Due to local soil conditions, there is a relatively small potential for these roads to intercept (re-route) surface and near-surface flow; few legacy logging roads in the area are intercepting flow. The risk of disturbance would increase with increasing road use. Thoroughly decommissioning the roads would help in alleviating the resulting compaction and help diffuse surface flow during storm events.

During road renovation, impacts to water quality would be expected while drainage structures are being improved or replaced. Impacts would be greatest if equipment is operating in and/or adjacent to the stream channels. Depending on weather conditions and site-specific bank characteristics, turbidity levels may remain elevated during the winter following culvert operations.

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

CWD Creation:
There would be no substantial impacts to water resources from indirect CWD creation (windthrow, broken tops, bark beetle infestation), girdling or overtopping trees to create snags or falling trees for CWD. Trees would be selected from outside SPZs and their removal would not likely impact stream shade, bank stability, or channel structure.

3.2.3.2 Cumulative Effects:

Because this project lies within two municipal watersheds with mixed ownership and lies above the transient snow zone, it has the potential to contribute to cumulative effects – particularly to increases in peak flow events. Consequently, a level 1 and a level 2 analyses were performed to determine the risk of increasing peak flows in the two project area 7th-field watersheds (Upper Rickreall Creek and Upper Boulder Creek), through density management.

These watersheds were initially analyzed for land ownership, vegetation type, age class, and extent of transient snow zone. Using these parameters and the methodology of the *Salem District Watershed Cumulative Effects Analysis Procedure 1994*, a risk factor ("rfactor") was calculated to determine the relative risk or sensitivity of areas to increases in runoff and consequently peak stream flows. Currently, the average rfactor value in these watersheds is less than "2", which is considered moderate (on a scale of 0-3, with 3 = high risk of increases to peak flows).

A level 1 analysis was also performed using the methodology of the *Oregon Watershed Assessment Manual.* Based on the Level 1 analysis, the risk of peak flow enhancement based on the proposed management activity was determined to be low.

However, because a considerable portion of these catchments do lie within the transient snow zone, with the potential for frequent rain-on-snow (ROS) events, the watersheds were further analyzed using the Washington Forest Practice Board's WAR model, which is recommended for regions within the transient snow zone and/or have a high potential for ROS events (Level 2 analysis).

The WAR model was used to generate estimates of peak flows under a hypothetical full forest cover, current conditions, and an estimated 10-year future condition (including the proposed project and other assumed actions on both BLM and private lands). A percent change from estimated full forest conditions and current conditions was calculated for both "normal" and "unusual" (larger than normal) storm events, as described in the Washington Forest Practices Board manual. The model did not predict a risk of increasing peak flows within the catchments due to timber harvest on both public and private lands. In addition, the predicted increases to peak flows in this assessment (for unusually large 2-year storm events) remained well below the 20% increase in a 2-year peak flow given as a threshold value for considering the effects of increased bed mobility and scour. As the proposed action entails a tree "thinning" and not regeneration harvest, it would be likely to retain the area as nearly "full forest" condition. Therefore it is not likely to contribute to significant increases to peak flows in the Upper Rickreall Creek and Upper Boulder Creek watersheds.

Other potential effects of the proposed action would be expected to be moderate and localized, included elevated turbidity levels during road crossing improvements. In addition, because the proposed action would affect such a small percentage of these catchments, it is unlikely to contribute to measurable cumulative effects in these watersheds. There are no known or anticipated BLM or private activities in the watersheds which would cumulatively affect water quality or basin characteristics.

3.2.3.3 No Action Alternative

The no action alternative would result in a continuation of the condition and trends as described in the Upper Siletz Watershed Analysis, the Rowell, Mill, Rickreall Creeks and Luckiamute River Watershed Analysis, and the Affected Environment section of this report. No additional disturbance to flow paths resulting from yarding and road work/use would occur. Streams disturbed from past management would continue to evolve towards a more stable condition.

3.2.4 Fisheries/ Aquatic Habitat

(IDT Reports incorporated by reference: K Line Density Management Project Environmental Assessment Fisheries pp. 1-6)

Affected Environment

East Draining Streams and Rivers: Fish distribution in the Rickreall Creek watershed is predominately affected by natural barriers to migration, however at least one human made barrier influences fish distribution. The falls in the community of Falls City is the upper limit of anadromy (sea-going) in the Little Luckiamute River (Willis et al 1960). Mercer Reservoir, 7 ¾ miles downstream from the project area in Rickreall Creek, blocks anadromous fish from further upstream movement [Oregon Department of Fish and Wildlife (ODFW) 1990]. The upper limit of resident fish in Rickreall Creek is approximately 2.5 miles downstream from the project area and anadromous fish would not historically have been able to migrate upstream beyond this limit.

Nearly 21 miles of Rickreall Creek were surveyed using ODFW protocols (ODFW 1993). Surveys extended to the treatment reach in the southern portions of Section 31. This reach is characterized as follows; 58% pools, average shade was estimated as 63%, sediment composition is primarily sand/gravel (68%) with silt/organics (18.8%) and cobble/bedrock (11.7%) and no key pieces of wood were found thru the reach. The surveyors noted the stream in the treatment area was boggy with signs of beaver activity. Oregon chub is not known to currently exist in any of the affected watersheds.

West Draining Streams and Rivers: Siletz Falls, 13 ¾ miles downstream in the Upper Siletz River watershed blocks coho salmon from further movement upstream (ODFW 1997). Summer steelhead trout historically passed the Siletz Falls and accessed the Upper Siletz River watershed including Boulder Creek, of which Bridge Forty Creek is a tributary. Boulder Creek Falls, 2.75 miles downstream of the project area and below the confluence with Bridge Forty Creek, is the upper limit of anadromy. Spring chinook salmon are allowed to migrate past Siletz Falls and their upper limit is approximately 5.2 miles downstream from the project area.

Coastal cutthroat trout occupy portions of the tributary to Bridge Forty Creek in proposed treatments areas of Section 31. Upper limits for cutthroat trout within the tributary to Bridge Forty Creek that drains the majority of the southwest portion of the treatment area, (See Fisheries Report Appendix B Map 1) are controlled by stream flow and organic debris accumulations. Old beaver sign is evident through much of the headwaters of this tributary. Connectivity to upper Bridge Forty Creek, and tributaries, is affected by two culverts crossing Road # 8-7-23 in the southwest corner of Section 31. Both culverts are perched, and bar passage to all fish species moving upstream. Old road crossing material downstream of the eastern tributary originating in the southwest corner further impairs access. Debris accumulations are creating moderate/low flow barriers as the stream goes subsurface. Impacts of this isolation on resident trout populations are unknown.

Bridge Forty Creek, and the tributary in the project area, have not been surveyed specifically for habitat conditions.

Threatened and Endangered and Special Status Species or Habitat:

Coastal cutthroat trout are considered a special status species by the BLM.

The NMFS listed the Upper Willamette River (UWR) Evolutionarily Significant Unit (ESU) winter steelhead trout as a threatened species under the Endangered Species Act (ESA). No effects to listed steelhead trout are anticipated from the proposed treatments (yarding/falling/pile burning/road construction/road renovation/road decommissioning) due to the distance (approximately 7 miles) to occupied habitat. The proposed dry season hauling on roads close to the Little Luckiamute River is not anticipated to affect listed steelhead trout since no surface erosion would be occurring during dry season hauling that could reach occupied habitat at least 1/3 of a mile downstream of the nearest stream crossing.

The NMFS has listed spring chinook salmon in the UWR ESU as threatened under the ESA. Spring chinook salmon in the UWR ESU reside over 24 miles downstream from the project area in the lower reaches of Rickreall Creek, and 25 miles downstream from the gravel haul routes in the Little Luckiamute River. No effects are anticipated to UWR Chinook salmon habitat due to distance to occupied habitat.

Oregon coast coho salmon do not migrate past Siletz Falls, 13 ¾ miles downstream from the project area (ODFW 1997). The NMFS proposed Oregon Coastal (OC) coho salmon as a threatened species under the ESA on June 14, 2004. On January 19, 2006 the NMFS determined that OC coho salmon did not warrant listing under the ESA at this time. The NMFS has withdrawn the proposed rule to list this ESU. Because NMFS has withdrawn the proposed listing, the proposed rule to designate critical habitat for this ESU is also withdrawn.

The U. S. Fish and Wildlife Service listed Oregon chub as endangered under the Endangered Species Act. Oregon chub historically were found throughout the Willamette River drainage (Scheerer 1999). There are no known chub populations currently residing in Rickreall Creek or the Little Luckiamute River. No effects are anticipated to Oregon chub historic habitat.

The proposed actions associated with K-Line Density Management Project are not expected to cause any effects to the listed fish or listed critical habitat in the Upper Siletz River, Rickreall Creek, or Luckiamute River Watersheds. This 'no effect' determination is based on the distance upstream of project activities from ESA listed fish habitat and project design criteria that include no harvest activity within SPZs, dry season hauling and post-project leave tree densities of 46-80 trees per acre. For this reason a no effect determination was made for UWR steelhead trout, UWR chinook salmon and Oregon chub.

Environmental Effects

3.2.4.1 Alternative 1 (Proposed Action)

Logging:

The proposed project would affect less than 0.001% of the forest cover in the Rickreall Creek Watershed and 0.5% of the forest cover in the Upper Siletz Watershed. The small percentage of forest cover affected is unlikely to measurably alter stream flows (LaForge, A. 2005. K Line Hydrology/Soils Report). Unmeasurable changes in peak and base stream flows are unlikely to affect fish habitat within the treatment area, and are even less likely to affect fish habitat downstream.

Removing trees which provide shade to the stream channel can negatively affect water temperatures. According to the stream shading sufficiency analysis done for the proposed treatment, the proposed no-entry SPZs of 50 feet was sufficient to protect critical shade in the primary shade zone, based on topography and average tree height (Haynes, A. 2005, K Line Silviculture Report). 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 50%. The hydrology analysis indicated that the no-entry buffers should maintain adequate shading and increases in stream temperatures at the site were considered unlikely (LaForge 2005). Based on the shade sufficiency analysis, the hydrology report water quality analysis, and the project design features, the proposed actions are unlikely to affect fish habitat both at the treatment site and downstream.

The proposed action would retain trees which would reach larger diameters (20 inches) 25 to 40 years earlier compared to the no treatment option, creating natural opportunities for higher quality LWD recruitment in the long term (Haynes 2005). In the short term, the smaller woody debris would continue to fall from within the untreated SPZs, and larger wood would begin to be recruited from farther up the slopes as the treated stands reach heights of 200 feet.

Thus, wood with a larger range of sizes would potentially be recruited into streams over the long term in treated stands. As short term recruitment of the existing CWD is expected to be maintained, the proposed actions are not expected to cause short term effects to fish habitat at the site or downstream. In the long term, growth in the size of trees within riparian reserves could beneficially affect LWD recruitment to the stream channel, thus potentially improving the quality/complexity of aquatic habitat adjacent to the treatment areas in the future.

The proposed project is unlikely to result in any measurable changes in sediment delivery to the surrounding stream network which could affect the turbidity, substrate composition, or the sediment transport regimes (LaForge 2005). Protection buffers, residual slash, and use of existing skid trails should keep sediment movement to a minimum. As the proposed actions are not likely to measurably alter water quality characteristics at the treatment sites, it would be unlikely to affect aquatic habitat adjacent to or downstream from the project area.

Road Work:

The proposed actions include the construction and reconstruction of approximately 6000 feet of road. The proposed roads are unlikely to increase drainage network in the watershed as the majority of new construction is outside riparian reserves, and no new construction would cross any existing stream channels. All new construction and reconstruction would be decommissioned following harvest. Thus road construction and reconstruction is unlikely to increase sediment or stream flows which may affect stream channels and fish.

Approximately 1200 feet of road may be constructed in the Riparian Reserve LUA of the Rickreall Creek watershed. No construction is proposed in the Upper Siletz River Watershed. Construction would not occur closer than 75 feet from the stream channel. There would be a negative effect to the recruitment potential of large wood to the upper reaches of Rickreall Creek as a result of proposed road construction. Transport potential of LWD in the affected streams is low, due to channel topography. No effects to fish habitat 2.5 miles downstream is anticipated from the proposed action.

Drainage improvement/replacements would occur on approximately 4 cross-drains and/or streams. These improvements would improve drainage and road surface conditions, resulting in less erosion into surrounding streams over time. Proposed road renovation treatments (ditchline reconstruction and crossing replacements) would result in minor short term increase in erosion, until re-establishment of vegetation in the following growing season. Treatments would be at least 300 feet from fish habitat. Construction in the stream channel would be limited to the instream working periods as defined by ODFW (2000). During construction, flows are expected to be very minimal and sediment is unlikely to reach fish downstream. In the following winter, sediment from the proposed actions may reach fish habitat during rain events. The amount of transported sediment is expected to be unmeasurable against background turbidity. In addition, the majority of sediment would likely be captured in the low gradient stream channels downstream of the treatment sites before reaching fish habitat.

Timber Hauling:

The majority of the haul route is located near the ridge top between Rickreall Creek and the Luckiamute River, with few stream crossings. Cutthroat trout occupy habitat along the Little Luckiamute River which parallels a portion of the haul route. Approximately 13 perennial stream crossings along the Little Luckiamute River are associated with the haul route (seven crossings are within 400 feet of the Little Luckiamute River).

The nearest graveled stream crossing associated with the haul route to steelhead trout occupied habitat is approximately 1/3 of a mile upstream from the falls in Falls City. Timber hauling, seasonally restricted such that no surface runoff from roads would occur, is not expected to affect fish habitat in any of the watersheds.

Pile Burning:
Pile burning is not expected to result in short term or long term effects to fish. Short term effects on soil infiltration is possible at the site of the burn pile resulting in surface runoff, but not likely to influence fish habitat. The no-entry buffers would provide sufficient distance from the stream to capture any surface erosion from pile burning treatments.

3.2.4.2 Cumulative Effects:

Cumulative effects of the proposed action to the vegetation and soil resources would be localized and not expected to affect other resources, subsequently no cumulative effects to fisheries are anticipated from these resources effects. The hydrology resource cumulative effects analysis indicated changes in peak flows are unlikely. Road work that may contribute sediment to the streams would be seasonally restricted and is expected to be small in scale, localized, and of short duration. The proposed actions are not expected to alter sediment regimes at the 5th field watershed scale in the short term or long term. The proposed road construction through the riparian reserve may affect Large Woody Debris (LWD) recruitment at the site scale in Upper Rickreall Creek. The proposed road thru riparian reserves would cover a very small amount of riparian acres (0.4 acres) and would affect an extremely small area compared to the total area of Rickreall Creek Watershed (124,000 acres). No cumulative effects to LWD is expected, as the change in LWD recruitment to stream channels is expected to be unmeasurable at the site scale and highly unlikely to influence aquatic habitat downstream. All causal mechanisms to affect aquatic resources are considered highly unlikely or are of such small scale to be unmeasurable at the 5th field watershed scale; subsequently no cumulative effects to the aquatic resources are anticipated from the proposed action.

3.2.4.3 No Action Alternative

Current stream habitat conditions would continue. Riparian Reserves would not be thinned and trees would continue to compete for sunlight. Over time, trees would thin themselves, but remaining trees would be of smaller diameter and have smaller crowns. Trees that die and fall would be smaller diameter. Smaller diameter trees would not function on the ground and in streams as long or as well as larger diameter trees. Road drainage improvements would not occur and ditch lines that currently run directly into streams would continue to funnel road sediment into area streams.

3.2.5 Wildlife

(IDT Report incorporated by reference: Biological Evaluation for Terrestrial Wildlife (pp. 1-10)

Affected Environment

Wildlife Structural or Habitat Components: Special Habitats/ Special Habitat components (snags, down logs, remnant old-growth trees):

A broad-scale analysis of federal lands within this part of the Northern Coast Range of Oregon was presented within the Late Successional Reserve Assessment (LSRA). The LSRA describes the BLM lands in the project area which form a distinct checker-board linkage between a larger block of federal ownership to the west, and smaller blocks of BLM ownership to the south. The LSRA considers this landscape to function as an important corridor of mostly younger-aged stands which form a connecting linkage between adjacent blocks of federal ownership, and which is expected to grow into a substantial patch of older forest habitat over the next several decades.

A summary of forest habitat conditions within the vicinity of the project area was analyzed within two watershed analysis documents: The *Upper Siletz Watershed Analysis* and the *Rowell Creek, Mill Creek, Rickreall Creek, and Luckiamute River Watershed Analysis*. The majority of the landscape is composed of early- and mid-seral forest habitats; with very little late-seral and old-growth remaining, except for a few patches on BLM lands (see Table 5).

Table 5. Vegetation Classes in the vicinity of the Project Area.[1]

Vegetation Class	Total Vicinity	%	BLM Only	%
Early-Seral	41,195.5	46.07	9,161.0	36.36
Mid-Seral	40,090.8	44.83	11,952.0	47.44
Late-Seral	928.9	1.04	885.0	3.51
Old-Growth	2,519.3	2.82	2,516.0	9.99
Hardwoods	4,237.2	4.74	642.0	2.55
Non-Forest Habitats	449.6	0.50	36.3	0.14
TOTALs	89,421.3	100.00	25,192.3	100.00

1). Data compiled for Upper Siletz 5th Field Watershed, Rickreall Creek 6th Field Watershed, and Mill Creek 6th Field Watershed (see USDI-BLM 1996, and USDI-BLM 1998).

Both of the watershed analysis documents point out that the structural characteristics of late-seral and old-growth forests, such as large snags, abundant down logs, and complex forest canopies are lacking across the landscape.

The K-Line project area lies at the top of a high, flat ridge line that divides the Oregon Coast Range. Most of the project area lies just above the 3000 foot elevation level. This area was extensively harvested and salvage logged throughout the 1950s and 1960s. As a result, the forest stands on BLM lands within the project area and adjoining sections are also dominated by early- and mid-seral forest stands with no late-seral or old-growth forests in the vicinity.

Following timber harvest or wildfire events, the remnant live trees, snags and down logs that are retained on the landscape can provide an important component to wildlife habitats; and are believed to add considerable complexity to young forest plantations (Carey 2002). Mid-seral conifer forests in this region exhibit a wide range in the density of snags and down logs that are present (Mellen et al. 2003, Rose et al. 2001, USDA-FS and USDI-BLM 1998). The legacy of logging and fire history in this project area has resulted in moderate to high accumulations of large down logs in advanced stages of decay within most units (see Table 1).

Only a few units are lacking this legacy of large down logs. Stem exclusion processes and a few blowdown areas have recently contributed moderate levels of small diameter snags and down logs in most of the proposed units (see Table 1). The volume of down logs within the project area falls well within the higher range of what might be expected to occur in natural stands in this seral stage (USDA-FS and USDI-BLM 1998), while the density of snags appears to be lower than what might be expected in most of the natural stands in this seral stage within this province (Mellen et al. 2003). None of the proposed treatment units contains any live old-growth remnant trees, and very few large diameter snags exist in this vicinity.

The Salem District RMP and the Watershed Analyses have recognized that special habitat features (caves, cliffs, exposed rock, talus, wetland types, and meadows) add valuable wildlife diversity to the local landscape. Within the proposed treatment units there are no known special habitat features. However, some special habitats (e.g. spring seeps and a wetland bog) do exist adjacent to the units.

Threatened or Endangered Wildlife Species or Habitat:
Northern spotted owls are the only federally listed wildlife species that occurs in forest habitats similar to the proposed treatment area. No spotted owl surveys were required for this project evaluation. However, extensive spotted owl surveys were completed in this vicinity in the early 1990s, with no spotted owls being detected in the project area. Since then, private timber companies have also surveyed much of their lands surrounding the project area, without finding any resident spotted owls. The nearest active spotted owl site is 3.5 miles northeast, in the Mill Creek drainage.

The proposed treatment units do not provide suitable habitat for spotted owls, but they might function as dispersal habitat since they do provide sub-canopy flying space for owls that are dispersing across the landscape. The project area falls within a critical habitat unit (CHU: OR-44) that has been designated for spotted owls. There are 27,640 acres of federal lands within CHU OR-44, and about 25,580 acres (92.5%) currently provide dispersal habitat for spotted owls. Dispersal habitat is considered a constituent element of spotted owl critical habitat (USDI-FWS 1992). The project area lies outside of Reserved Pair Areas that have been designated by the NWFP for additional protection of spotted owl habitat (USDA-FS and USDI-BLM 2000).

Marbled murrelets are not expected to occur within the project area since they do not nest in young forest stands which lack canopy structures for nest platforms (McShane et al. 2004); and since habitats above 3000 feet are unlikely to be occupied by murrelets, even if suitable nesting structure is present (USDI-FWS 2004, Appendix E, page 161). The BLM lands within this project area have been designated as critical habitat for this species (Unit: OR-02-d), but no constituent elements of critical habitat are present within the proposed treatment units (USDI-FWS 1996).

Other Special Status Species (including Survey and Manage Species):
One invertebrate species that is listed as Bureau Sensitive was identified as "potentially affected" by this proposed action. The Johnsons' hairstreak butterfly is known to inhabit the Coast Range where it occurs in close association with its host plant, dwarf mistletoe. Dwarf mistletoe infests hemlock trees in portions of the proposed units, and such infestations are well distributed throughout the watershed, particularly at mid and lower elevations father to the west.

Environmental Effects

3.2.5.1 Alternative 1 (Proposed Action)

Wildlife Habitats and Habitat Components.
The proposed density management of about 304 acres would change the existing forest structure and alter the development of future forest stand conditions. The direct and indirect changes anticipated to occur to forest habitat characteristics from this project are:

Short-term (less than 10 years)

- Light to moderate reduction of canopy closure (resulting canopy greater than 40%) over entire treatment area which represents less than 3% of the mid-seral forests within the adjoining watersheds;
- 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 mostly be offset by immediate creation of larger CWD of desirable size, and augmentation of decadence processes;
- retention and enhancement of hardwood tree and shrub diversity.

Long-term (greater than 10 years)

- a substantial 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, 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.

The proposed action 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 (most of which have moderate to high levels of large CWD in advanced stages of decay) would benefit from augmentation of CWD which would provide larger pieces of hard material sooner than if left untreated, and which would initiate desired decadence processes (topping, girdling) in the larger-sized residual trees.

Threatened and Endangered Species and their Habitat:
The proposed action is considered to be no effect to marbled murrelets and spotted owls since no suitable habitat would be modified and neither of these species are known to occur in this area. The proposed action is considered to be a may affect, not likely adverse affect to spotted owl critical habitat, because it would modify a small amount (1.3%) of the available dispersal habitat within CHU OR-44.

The short-term reduction in canopy closure may slightly diminish the quality of dispersal habitat for owls, but since the entire project area would average more than 40% canopy closure, the treated stands are anticipated to retain their function as dispersal habitat for spotted owls in the short-term and would likely achieve suitable habitat quality for spotted owls in the long-term at a faster rate than if left untreated.

Other Special Status Species (Including Survey and Manage):
The habitat available for the Johnson's hairstreak butterfly may be slightly degraded due to the thinning harvest which could remove some hemlock trees that are infected with dwarf mistletoe (its host plant). This action is not likely to have a substantial impact on this species since trees with dwarf mistletoe would be retained throughout all units where it is present, and dwarf mistletoe appears to be well distributed throughout the watershed, especially in older conifer stands farther to the west where hemlock is a more prominent component.

Site specific concerns for all wildlife species have been adequately addressed and minimized by design features incorporated within this proposed action alternative. Potential negative effects such as disturbance and disruption of wildlife use patterns, temporary increase in road density, and habitat alteration are anticipated to be short-term and local in nature, and would not contribute to the need to list any Special Status Species.

3.2.5.2 Cumulative Effects:

Within the northern Oregon Coast Range, the condition of dispersal habitat for spotted owls is a matter of elevated concern (USDI-FWS 1990; USDI-FWS 1992; Courtney et al. 2004). The proposed action (304 acres) along with foreseeable BLM thinnings (600 acres) would alter about 3.6% of the available dispersal habitat in critical habitat unit OR-44. Since the majority of the proposed thinning harvests are designed to maintain an average of at least 40% canopy closure, the treated stands would likely continue to function as dispersal habitat, whereby this project and all foreseeable federal thinning harvests would not contribute to a cumulative loss of dispersal habitat within critical habitat unit OR-44, but rather these thinning treatments would likely provide long-term beneficial effects to the quality of critical habitat.

Due to ecological succession and forest management, the amount of forest habitat in each seral stage within the local watersheds is not stagnant, but constantly in transition from early open habitats toward mature forest stands. Thinning harvests such as the proposed action would alter existing forest structure, yet these treatments do not result in a loss of habitat for most of the wildlife species that are known or suspected to use these forests. The cumulative effect on habitat availability for wildlife species of concern resulting from past BLM thinning harvests and foreseeable thinning treatments is considered negligible.

3.2.5.3 No Action Alternative

The no action alternative would result in no change to the affected environment for wildlife species and their habitat. Short-term impacts to wildlife species and habitats as described for the proposed action would be avoided. However, the anticipated benefits to future conditions of late-seral forest habitat in this project area would not be achieved.

3.2.6 Fuels\Air Quality

(IDT Report incorporated by reference: K-Line Timber Sale Proposal Fuels Report pp. 1-4)

Affected Environment

The proposed project areas are presently occupied by fairly continuous stands of approximately 50 year old Douglas fir timber with minor amounts of western hemlock and a small amount of noble fir. Undergrowth in the project area is a light to moderate growth of: salal, vine maple, sword fern, and red and blue huckleberry. In the timbered areas there is a light to moderate accumulation of dead woody material on the ground. Larger downed logs are fairly scarce as are large snags. Small snags less than 10" DBHOB are common. The estimated total dead fuel loading for these stands varies from 5-25 tons per acre range. Much of the existing down material is rotten or only partially sound.

Environmental Effects

3.2.6.1 Alternative 1 (Proposed Action)

Fuels: Fuel loading, risk of a fire start and resistance to control would all increase at the sites as a result of the proposed action. Slash and organic debris created by the road work would result in creation of an estimated 130 tons of debris. Approximately half of the right-of-way debris would end up in piles for burning, the other half would be scattered. Slash in landings resulting from timber harvest is estimated to vary from 510 tons if a harvester forwarder system is used for the ground base yarding up to 1050 tons if tractors are used for the ground based yarding. Slash created from timber harvest would add an estimated 10-20 tons per acre of dead fuel to the thinned areas. The fuel arrangement would be discontinuous. The patch cut openings would be primarily light logging slash. Risk of a fire start in the untreated slash would be greatest during the first season following cutting, the period when needles dry out but remain attached. These highly flammable "red needles" generally fall off within one year and risk of a fire start greatly diminishes. Untreated slash would generally decompose to the point where it no longer contributes substantially to increased fire risk or resistance to control, in approximately 15 years.

The logging slash created would be left in place, untreated, resulting in a total residual dead fuel loading of 15-45 tons per acre. The decision to leave the majority of the slash untreated under this proposed action is based on a number of factors: The number of fires that have occurred in this area historically has been very low and it is unlikely that this additional slash will result in a fire occurring in the area. Very little treatment of slash on commercial thinning areas has been done in the past in NW Oregon and there have been very few fires resulting from this practice, the cost to treat all the slash would be fairly high (greater than $400 per acre), if a fire did occur, most of the timber value would be salvageable, the general area in and around this project is not a high use recreation area (primary recreational use is hunting) so the primary ignition source (people) will not be a high risk factor for a fire start and spot treatment of highest risk slash along roads and on landings has been a fairly cost effective treatment as witnessed on similar projects in the past.

Increasing the spacing between the tree crowns in these stands would have the beneficial result of substantially decreasing the potential for crown fire occurrence in the treated stands in the event of a wildfire.

The slash created from clearing the existing road to be reconstructed and from clearing the new road construction, would be piled, covered and burned where heavy concentrations are created. Fire risk along the roads and within the patch cuts would be reduced when slash piles are burned off.

Air Quality Burning approximately 600 to 1100 tons of dry, cured, piled fuels under favorable atmospheric conditions at high elevations in the coast range is not expected to result in any long term negative effects to the air quality in the air shed. Locally within ¼ mile of the piles there may be some very short term smoke impacts after piles are ignited resulting from drift smoke. Once dry piles have been ignited, 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 days as the piles cool and burn out (sooner if rain develops). Generally this smoke only affects the immediate area (¼ mile or less) around the pile.

Cumulative Effects:

There would be few cumulative effects to this resource, as the effects from the project would be local, and there would be no other uses affecting this resource. Burning of slash will always be coordinated with the Oregon State Smoke Management Plan which serves to coordinate all forest burning activities on a regional scale to prevent negative impacts to local and regional air sheds. Based on this control of smoke production there are no expected cumulative effects from the planned fuels treatment under this proposal. Although there would be an increase in fuel loading and resultant fire hazard in the short term, there would be positive net benefits in the long term due to the proposed thinning treatment. When looked at from a watershed scale, however, the thinning of approximately 304 acres of forest habitat would reduce the long term (5 or more years) potential of the stand to carry a crown fire. This is because of the spacing out of the trees and their crowns, in addition to removal of current ladder fuels that are conducive to the spread of wildfire.

3.2.6.2 No Action Alternative

With a no action alternative there would be no change from the current conditions for the fuels resource. Conditions would remain as they are at present. No changes in aerial extent of disturbed fuel loadings.

4.0 Compliance with the Components of the Aquatic Conservation Strategy

Table 6 and Appendix 1 describe the project's compliance with the four components of the Aquatic Conservation Strategy.

Table 6: Projects' Compliance with Components of the Aquatic Conservation Strategy

ACS Component	Project Consistency
Component 1 - Riparian Reserves	The Riparian Reserve boundaries would be established with direction from the Salem District Resource Management Plan (p. 10). Additionally, maintaining canopy cover along all streams would protect stream bank stability and water temperature. Additionally, there would be a small amount (1200 feet) of new road construction within the Riparian Reserve.
Component 2 - Key Watershed	The project is located within the Rickreall Creek and Upper Siletz River watersheds, which are not designated as key watersheds.
Component 3 - Watershed Analysis	The North Fork Siletz River was analyzed as part of the Upper Siletz Watershed Analysis (USDI, Dec. 1996). Rickreall Creek was analyzed as part of the Rowell, Mill and,Rickreall Creek and Luckiamute River Watershed Analysis (USDI, Sept. 1998).
Component 4 - Watershed Restoration	Increasing stand diversity in Riparian Reserves addresses this component.

K-Line LSR Enhancement Project - Over the long term, this project should aid in meeting ACS objectives by speeding the development of older forest characteristics in Riparian Reserves, including increased large wood recruitment for stream channels. In addition, more open stands would allow for the growth of important riparian species in the understory (EA Appendix 1).

5.0 COMPARISON OF ALTERNATIVES WITH REGARD TO PURPOSE AND NEED

5.1 Comparison of Alternatives With Regard to the Purpose and Need

Table 7: Comparison of Alternative by Purpose and Need

Purpose and Need (EA section 2.1)	Proposed Action	No Action
Development of late-successional forest habitat (patch openings, clumps, CWD, gaps), snag creation and protection etc.	Creates patch openings with adjacent clumps of trees. Retains existing limbs on open grown trees through selective cutting of trees. Larger diameter trees felled for safety or operational reasons would be retained for CWD.	Does not meet this purpose and need. Creates high level of small size CWD for the next decade or two in all stands within the project area.

Purpose and Need (EA section 2.1)	Proposed Action	No Action
Increase structural diversity in relatively uniform conifer stands.	Reduces tree densities within stands to increase diameter growth, preserve limbs and high crown ratios. Increases species diversity and understory regeneration, shrubs, forbs, etc.	Does not meet purpose and need. Maintains a highly dense, uniform, small diameter stand of trees with receding crown ratios, loss of limbs and loss of growth. Understory regeneration, shrubs etc. would be lacking.
Provides appropriate access for commercial harvest and silvicultural practices used to meet the objectives above, while minimizing increases in road densities.	Constructs 5700 feet of new road and reconstructs 300 feet of road. Following harvest, all of the new and reconstruction would be decommissioned.	No change. Maintain existing road densities.
	Would implement maintenance on feeder roads, allowing for continued access. Would also make needed improvements by minimizing road related runoff and sediment production.	Delay maintenance on feeder roads, main routes would be maintained.

6.0 LIST OF PREPARERS

Table 8: List of Preparers

Resource	Name	Initial	Date
Cultural Resources	Frances Philipek		
Hydrology/Water Quality/Soils	Ashley La Forge		
Silviculture/Riparian Ecology	Amy Haynes		
Botany TES and Special Status Plant Species	Ron Exeter		
Wildlife TES and Special Status Animal Species	Scott Hopkins		
Fuels/Air Quality	Tom Tomczyk		
Fisheries	Scott Snedaker		
Logging	Phil Sjoding		
Engineering	Steve Cyrus		
Recreation	Traci Meredith		
NEPA	Carolyn Sands		

7.0 CONTACTS AND CONSULTATION

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

U.S. Fish and Wildlife Service

To address concerns for effects to listed wildlife species and potential modification of critical habitats, the proposed action was consulted upon with the U.S. Fish and Wildlife Service, as required under Section 7 of the Endangered Species Act. Consultation for this proposed action was facilitated by its inclusion within a programmatic Biological Assessment (USDA-FS and USDI-BLM 2004) that analyzed all projects that may modify the habitat of listed wildlife species on federal lands within the Northern Oregon Coast Range during fiscal years 2005 and 2006. The resulting Biological Opinion (reference #1-7-2005-F-0005; USDI-FWS 2004), concluded that this action would not result in jeopardy to listed species and would not adversely modify critical habitat for any species. This proposed action has been designed to incorporate all appropriate design standards set forth in the Biological Assessment to ensure compliance with the Terms and Conditions included within the Biological Opinion.

National Marine Fisheries Service

Consultation with National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) is required for projects that 'may affect' listed species. Protection of Essential Fish Habitat (EFH) as described by the Magnuson/Stevens Fisheries Conservation and Management Act and consultation with NOAA-NMFS is required for all projects which may adversely affect EFH of coho or chinook salmon. The proposed K-Line project is not expected to affect EFH due to distance of all activities associated with the K-Line project from occupied habitat.

The proposed actions associated with the K-Line LSR Enhancement Project are not expected to cause any effects to the listed fish or listed critical habitat in the Rickreall Creek or Luckiamute River Watersheds. A determination has been made that this proposed project would have 'no effect' on UWR steelhead trout and chinook salmon and Oregon chub. This 'no effect' determination is based on the distance upstream of the project area from ESA listed fish habitat (approximately 7 and 24 miles downstream) and project design criteria that include no harvest activity within SPZs, dry season hauling and post-project leave tree densities of 46-80 trees per acre. Due to the "no effect" determination this project was not consulted upon with the NMFS.

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

The project area occurs in the 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.

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

- A scoping letter, dated February 27, 2004, was sent to 18 potentially affected and/or interested individuals, groups, and agencies. One response was received during the scoping period.

- A description of the project was included in the December 2004, and March, June and December 2005 project updates to solicit comments on the proposed projects.

7.3.1 30-day public comment period

- The EA and FONSI will be made available for public review March 15, 2006 to April 15, 2006. The notice for public comment will be published in a legal notice by the *Polk County Itemizer Observer* newspaper. Comments received by the Marys Peak Resource Area of the Salem District Office, 1717 Fabry Road SE, Salem, Oregon 97306, on or before April 15, 2006 will be considered in making the final decisions for this project.

8.0 MAJOR SOURCES AND COMMON ACRONYMS

8.1 Major Sources

8.1.1 Interdisciplinary Team Reports:

Exeter, R. 2006. Botanical Report. Marys Peak Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Haynes, A. 2005. Silviculture/Riparian Reserves Report. Marys Peak Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Hopkins, S. 2005. Biological Evaluation. Marys Peak Resource Area, Salem District, Bureau of Land Management. Salem, OR.

La Forge, A. 2005. K-Line Environmental Assessment Soils/Hydro Report. Marys Peak Resource Area, Salem District, Bureau of Land Management. Salem, OR.

La Forge, A. 2005. Cumulative Effects Analysis for K-Line Thinning. Marys Peak Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Snedaker, S. 2006 K Line Density Management Project Environmental Assessment Fisheries. Marys Peak Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Tomczyk, T. 2005. K-Line Timber Sale Proposal Fuels Report. Marys Peak Resource Area, Salem District, Bureau of Land Management. Salem, OR.

8.1.2 Additional References:

Carey, A. 2002. Ecological Foundations of Biodiversity: Promoting Habitat Complexity in Second-Growth Forests. Brochure. Pacific Northwest Research Station, USDA Forest Service, Forestry Sciences Laboratory, Portland, Oregon [Available at http://www.fs.fed.us/pnw/].

Courtney, S, J. Blakesley, R. Bigley, M. Cody, J. Dumbacher, R. Fleischer, A. Franklin, J. Franklin, R. Gutiérrez, J. Marzluff, L. Sztukowski. 2004. Scientific evaluation of the status of the Northern Spotted Owl. Unpublished Report. Sustainable Ecosystems Institute, Portland, Oregon. Prepared for the U.S. Fish and Wildlife Service, Region 1. Portland, Oregon.

McShane, C., T. Hamer, H. Carter, G. Swartzman, V. Friesen, D. Ainley, R. Tressler, K. Nelson, A. Burger, L. Spear, T. Mohagen, R. Martin, L. Henkel, K. Prindle, C. Strong, and J. Keany. 2004. Evaluation report for the 5-year status review of the marbled murrelet in Washington, Oregon, and California. Unpublished Report. EDAW, Inc. Seattle, Washington. Prepared for the U.S. Fish and Wildlife Service, Region 1. Portland, Oregon.

Mellen, Kim, Bruce G. Marcot, Janet L. Ohmann, Karen Waddell, Susan A. Livingston, Elizabeth A. Willhite, Bruce B. Hostetler, Catherine Ogden, and Tina Dreisbach. 2003. DecAID, the decayed wood advisor for managing snags, partially dead trees, and down wood for biodiversity in forests of Washington and Oregon. Version 1.10. USDA Forest Service, Pacific Northwest Region and Pacific Northwest Research Station; USDI Fish and Wildlife Service, Oregon State Office; Portland, Oregon [webpage: http://wwwnotes.fs.fed.us:81/pnw/DecAID/DecAID.nsf].

Rose, C.L., B.G. Marcot, T.K. Mellen, J.L. Ohmann, K.L. Waddell, D.L. Lindley, and B. Schreiber. 2001. Decaying Wood in Pacific Northwest Forests: Concepts and Tools for Habitat Management. In: Johnson D.H., and T.A. O'Neil, editors. 2001. Wildlife-Habitat Relationships in Oregon and Washington. OSU Press, Corvallis, Oregon.

USDA. Forest Service, USDI. Bureau of Land Management. 2001. Record of Decision and Standards and Guidelines for Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines. Portland, OR.

USDA. Forest Service, USDI. Bureau of Land Management. 2004b. Final Draft, Biological Assessment of habitat-modification projects proposed during fiscal years 2005 and 2006 in the North Coast Province, Oregon that would affect bald eagles, northern spotted owls, or marbled murrelets, or would modify the critical habitats of the northern spotted owl or the marbled murrelet. Salem District BLM, Salem, Oregon. Unpublished document.

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

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

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. 1998. Rowell Creek, Mill Creek, Rickreall Creek, and Luckiamute River Watershed Analysis. Salem, Oregon

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

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.

USDI. Bureau of Land Management. 1992. Final Record of Decision for Western Oregon Program Management of Competing Vegetation. (August 1992).

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

U.S. Department of the Interior, Fish and Wildlife Service [USDI-FWS]. 2004. Biological Opinion and Letter of Concurrence for Effects to Bald Eagles, Spotted Owls, Marbled Murrelets, Spotted Owl Critical Habitat and Marbled Murrelet Critical Habitat from the U.S. Department of Interior, Bureau of Land Management, Eugene District and Salem District, and U.S. Department of Agriculture, Siuslaw National Forest fiscal year 2005/2006 habitat modification activities within the North Coast Province. USDI, Fish and Wildlife Service, Oregon Fish and Wildlife Office, Portland, Oregon. Dated December 01, 2004. [Reference Number 1-7-2005-F-0005].

U.S. Department of the Interior, Fish and Wildlife Service [USDI-FWS]. 1996. Final designation of critical habitat for the marbled murrelet; Final Rule. Federal Register, Volume 61 (102): 26255-26320. Washington, DC. May 24, 1996.

U.S. Department of the Interior, Fish and Wildlife Service [USDI-FWS]. 1992. Endangered and threatened wildlife and plants; determination of Critical Habitat for the northern spotted owl. Federal Register, Volume 57(10):1796-1838. Washington, DC. January15, 1992.

U.S. Department of the Interior, Fish and Wildlife Service [USDI-FWS]. 1990. Final Listing, Determination of Threatened Status for the Northern Spotted Owl. Federal Register, Volume 55: 26114-26194. Washington, DC. June 26, 1990.

8.2 Common Acronyms

ACS – Aquatic Conservation Strategy
LSR – Late Successional Reserve
BLM – Bureau of Land Management
BMP – Best Management Practice(s)
BO – Biological Opinion
CWD – Coarse Woody Debris
DBHOB – Diameter Breast Height Outside Bark
EA – Environmental Assessment
ESA – Endangered Species Act
FONSI – Finding of No Significant Impact
LUA – Land Use Allocation
LWD – Large Woody Debris
LSRA – Late-Successional Reserve Assessment for Oregon's North Coast Range Adaptive Management Area
NEPA – National Environmental Policy Act (1969)
NMFS – National Marine Fisheries Service
NWFP – Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl and Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Related Species within the Range of the Northern Spotted Owl (1994) (Northwest Forest Plan)
ODEQ – Oregon Department of Environmental Quality
ODFW – Oregon Department of Fish and Wildlife
RMP – Salem District Record of Decision and Resource Management Plan (1995)
RMP/FEIS – Salem District Proposed Resource Management Plan / Final Environmental Impact Statement (1994)
RR – Riparian Reserves (land use allocation)
S&M/FSEIS – Final Supplemental Environmental Impact Statement For Amendment to the Survey and Manage, Protection Buffer, and Other Mitigation Measures Standards and Guidelines (2000)
S&M ROD – Record of Decision and Standards and Guidelines for Amendment to the Survey and Manage, Protection Buffer, and Other Mitigation Measures Standards and Guidelines (2001)
SPZ – Stream Protection Zone (no-cut protection zone/no-cut buffer/no-treatment zone/stream buffer)
USDI – United States Department of the Interior

9.0 APPENDICES

9.1 Appendix 1 - Aquatic Conservation Strategy Objectives

9.1.1 Documentation of the Projects' Consistency with the Nine Aquatic Conservation Strategy Objectives

Unless otherwise specified, the No Action Alternative would not prevent the attainment of any of the nine ACS objectives. Current conditions and trends would continue and are described in EA Section 3.2. EA section 4.0 describes the project's consistency with the Aquatic Conservation Strategy Objectives.

Table 9: Projects' Consistency with the Nine Aquatic Conservation Strategy Objectives

Aquatic Conservation Strategy Objectives (ACSOs)	Project 1 - Alternative 1 (EA section 2.4)
1. Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features.	Does not prevent the attainment of ACSO 1. Treating Riparian Reserves to increase species vigor, diversity, and CWD would help restore the distribution and complexity of landscape features in the watershed.
2. Maintain and restore spatial and temporal connectivity within and between watersheds.	Does not prevent the attainment of ACSO 2. Long term connectivity of terrestrial watershed features would be improved by increasing the availability and proximity of functioning riparian habitat.
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-treatment buffers adjacent to all surface water would maintain the physical integrity of the aquatic system. Some alteration of stream channels would occur during culvert replacements.
4. Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems.	Does not prevent the attainment of ACSO 4. No measurable effects to water quality would be anticipated from the proposed action. Stream buffers would eliminate disturbance of streamside vegetation; no trees would be cut from the stream bank or where roots are stabilizing the stream bank. No activities would take place directly in or adjacent to stream channels.
5. Maintain and restore the sediment regime under which aquatic ecosystems evolved.	Does not prevent the attainment of ACSO 5. The proposed project is designed to minimize the risk of a mass soil movement event (slump/landslide). No-treatment buffers and project design features would minimize any potential sediment from harvest, burning, and road-related activities from reaching water bodies.
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. The proposed alternative would not measurably alter instream flows. The proposed timber harvest would affect only 0.001% of the forest cover in the Rickreall Creek watershed and 0.5% of forest cover in the Upper Siletz watershed – well below the 20% threshold for measurable effects.

Aquatic Conservation Strategy Objectives (ACSOs)	Project 1 - Alternative 1 (EA section 2.4)
7. Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.	Does not prevent the attainment of ACSO 7. Project design features, such as no-treatment buffers, coupled with the small % of vegetation proposed to be removed, would maintain groundwater levels and floodplain inundation rates.
8. Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands.	Does not prevent the attainment of ACSO 8. Vegetation management within the Riparian Reserve would help restore structural diversity.
9. Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.	Does not prevent the attainment of ACSO 9. Density management would help restore RR habitat by increasing species and structural diversity and increasing snags & CWD.

9.2 Appendix 2 - Response to Scoping Comments

A scoping letter, dated February 27, 2004, was sent to 18 potentially affected and/or interested individuals, groups, and agencies. One response was received during the scoping period.

9.2.1 Summary of comments and BLM responses

The following addresses comments raised in one letter from the public received as a result of scoping (40 CFR Part 1501.7). Additional supporting information can be found in Specialists' Reports in the NEPA file.

9.2.1.1 Oregon Natural Resource Council (March 30, 2004)

1. Comment: "*This project would involve extensive new road construction. The proposed roads will impact hydrology, reduce soil productivity and provide a corridor for invasive weeds. 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. As stated in the EA p. 23, "constructing/reconstructing approximately 6000 feet of road would result in loss of topsoil and compaction of sub-soil on approximately 2.2 acre (about 0.7% of the total proposed project area). The area is currently forested land that would be converted to non-forested. The roads to be constructed would be on gentle topography (grades of approximately 3 to 10%). All of the new construction would be decommissioned following harvest, so some recovery back to a forested condition would occur in the area over time". The EA on p. 28 concluded that "due to local soil conditions, there is a relatively small potential for these roads to intercept (re-route) surface and near-surface flow".

The EA recognized on pp. 19-20 that "all road construction, reconstruction and decommissioning would disrupt areas of duff and expose mineral soil. Non-native species may become established in any exposed mineral soil areas. These non-native species often persist for several years but soon decline as native vegetation increases within the project areas. Sowing exposed soil areas is expected to abate the establishment of noxious weeds. Any adverse effects from noxious weeds within the project area are not anticipated. The risk rating for the long-term establishment of noxious weed species and consequences of adverse effects on this project area is low".

Best Management Practices would be followed during road construction to reduce the risk of adverse effects to aquatic resources. The following table includes the length of each new road to be constructed and the number of acres accessed by each road and the computed cost:benefit ratio of the number of acres treated per mile of road construction.

Road #	Primary Road Work	Miles	Associated Unit Acres	Acres of Unit/Mile of Road
T1	New	0.44	46	105
T4	New	0.45	40	89
T5	New	0.20	23	115

2. Comment: *The BLM must develop an alternative that does not construct spurs longer than 200 feet. Developing one alternative that builds extensive roads and a no-action alternative does not provide the public with the broad range of alternatives as required by NEPA.*

Response: As stated in Section 1.5 (p. 4) of the EA, the purpose of the project is to manage developing forest stands and wildlife habitat in LSR LUA so that late-successional forest conditions can be developed, accelerated, and enhanced; manage early to mid-seral stands in Riparian Reserve LUA so that growth of trees can be accelerated to restore large conifers, habitat for populations of native riparian-dependent plants, invertebrates, and vertebrate species can be enhanced or restored; and structural and spatial stand diversity can be improved on a site-specific and landscape level in the long term. In addition there is a need to maintain and develop a safe, efficient and environmentally sound road system that provides appropriate access for timber harvest and silvicultural practices used to meet the objectives above, and reduces environmental effects associated with identified existing roads within the project area.

As mentioned in Section 2.4 (p. 10) of the EA, "an alternative that would limit the amount of new spur road construction distances to 200 feet would have reduced the density management treatment area from the proposed 304 acres to approximately 151 acres. The area eliminated 153 acres from density management, consisting of approximately 78 acres of skyline yarding and 75 acres of ground based yarding. These areas would become inaccessible to harvest operations due to adverse topography features and exceedingly high ground based logging costs. This reduction would have severely reduced the development, acceleration, and enhancement of mid-seral forest toward late-successional forest conditions. Consequently, this alternative was considered but not analyzed in detail.

3. **Comment:** *"ONRC has repeatedly asked the BLM to use the research that Andrew Carey developed that recommends variability on a small scale in order to promote diversity of tree spacing between and among stands. Thin from below prescriptions fail to do more than release the dominant and co-dominant trees, until the canopy closes again. These prescriptions do not achieve variability as prescribed for in LSR objectives.*

   Response: We appreciate the references you gave us, most of which we have read. We always try to achieve variable density in our LSR treatments, within our operational constraints, and believe that our prescription would accomplish that. We plan to create canopy gaps over the project area which would equal approximately 5% of the treatment area, and also to leave small unthinned areas (clumps). The clumps and gaps would range from approximately .25 to 1 acre, as recommended by Andrew Carey and Jerry Franklin in the reference you gave us (http//www.reo.gov/ama/franklin2001.htm).

   We believe the smaller gaps would promote increased growth of shrub species (rhododendron and vine maple), and the larger gaps would promote conifer understory species such as western red cedar and western hemlock, which we plan to plant. Within the larger gaps we would leave large "wolfy" trees or trees with other wildlife values, releasing them completely so as to promote epicormic branching and deep crowns. Between the gaps, we plan to mark the project in a range of basal areas, probably by assigning each marker a different basal area, with the goal of achieving spacing variability at the scale of approximately ½ acre. We would also reserve all western hemlock under 14" DBH, all conifers over 24" DBH and all hardwoods to give us additional spacing variability.

   Vertical diversity would be difficult to achieve in the short term, given that the stand consists of mostly Douglas-fir of the same height, except those dying from suppression. Although we are primarily thinning Douglas-fir from below, the marking guide calls for leaving healthy intermediate trees in place of dominant ones, recognizing that there would be few of them. However, by leaving most of the western hemlock, and all of the western red cedar, noble fir and hardwoods, we would achieve some height differentiation.

4. **Comment:** *All ecologically significant large snags and woody debris must be retained. Snags should be carefully inventoried by species, size decay status, quality and location and should be treated as "special habitats". They should be given special attention during project planning and implementation (i.e. not harvesting trees if they are near hazardous snags greater than 15" DBHOB). BLM's RMP and the NFP do not provide adequate protection of legacy features.*

   Response: We agree 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 believe the design features for the protection of existing down logs and snags as stated in the EA (page 15) provides the necessary protection for these resources and removes any incentive for needlessly felling or removing them.

   We have also purposely designed most of our un-thinned clumps (skips) to protect one or more snags. We reviewed in the field one of our recently completed projects (Little Boulder Thinning) with former and current ONRC representatives (Jeremy Hall and Chandra LeGue) during the summer of 2005 where retention of larger diameter snags was accomplished without significant loss to this important resource.

This project's success in retaining large diameter snags is not unique, as it has been our fairly extensive experience that the loss of large diameter snags for operational/safety reasons rarely happens in our units, but is occasionally necessary in close proximity to roads, landings, and yarding corridors/skid trails.

5. **Comment:** *The BLM must use the DecAID decision support tool and use it appropriately. "The BLM is obligated to use the best available science to protect public resources".*

   Response: The EA discusses both snag and down log retention on Page 6 (see Table 1) and on Page 29. The BLM is not relying on old out-dated science concerning management of snags and down logs. As required by the Northwest Forest Plan, a Late-Successional Reserve Assessment was completed in January 1998 that covers BLM lands in the project area, and addresses management considerations for retention and creation of CWD based on relevant research findings from a number of studies within the Coast Range Province. This document, along with the DecAID tool and other references provided a foundation for development of the prescription for snags and down logs, and are cited in the Biological Evaluation of wildlife resources.

9.3 Appendix 3 – K-LINE MARKING GUIDE

The goals of the project are to increase understory canopy development, maintain existing snags and down wood, increase species diversity, & increase the diameter growth of the leave trees.

Spacing:

- Variable spacing would be accomplished by assigning a different Basal Area Factor (BAF) to each crew member, or by assigning a different BAF each day or each partial day (basal area ranging from 80 to 120 sq. ft/acre).
- Take advantage of diversity already occurring in the stand by leaving clumps of trees around snags. Assume some of the green trees in those clumps will end up as snags/down wood.
- Open up the crowns of "wolfy trees" (big thick branches, deep crowns) completely, removing all the trees around them.
- Cut extra trees around understory conifers, or reserved western hemlock, giving them enough light for survival/growth. Conversely, if it looks like a patch of small conifers will be destroyed by yarding, leave some large trees around them to act as a buffer.

Species:

- In Units 31A, 31B and 31D only Douglas-fir trees would be cut unless the western hemlock is growing in clumps, in which case, the western hemlock would be thinned. When comparable adjacent trees exist, western hemlock would be reserved over Douglas-fir.
- In Unit 31C only Douglas fir trees would be cut.
- All western hemlock trees 14.0" DBHOB and smaller would be reserved.
- All trees greater than 24.1" DBHOB would be reserved.

Tree Condition:

- Trees with complex structures (forked, topless, and deformities) would be reserved individually or left in clumps where possible.
- Generally, the biggest and best trees (except as above), would be left. However, if there are healthy looking intermediate trees, dominant trees could be cut instead. This would maintain as much vertical diversity as possible.

9.4 Appendix 4 – Compliance with Current Survey and Manage Direction

2001 ROD Compliance Review: Survey & Manage Wildlife Species

Environmental Analysis File

Salem District BLM, Marys Peak Resource Area

Project Name:	**K-Line LSR Enhancement Project**	Prepared By:	**Scott Hopkins**
Project Type:	**Density Management Thinning**	Preparation Date:	**2/27/2006**
Location:	**T.07S., R.07W., Section 31.**	S&M List Date:	**12/19/2003**

Table A. Survey & Manage Wildlife Species Known and Suspected on Salem District BLM. The species listed below were compiled from the 2003 Annual Species Review (IM-OR-2004-034) and incorporates those vertebrate and invertebrate species whose known or suspected range includes the Salem District according to: Survey Protocols for Amphibians under the Survey & Manage Provision of the Northwest Forest Plan, version 3.0 (1999), Survey protocol for the Great Gray Owl within the Range of the Northwest Forest Plan, version 3.0 (Jan. 2004), Survey Protocol for the Red Tree Vole, version 2.1 (Oct. 2002) and those mollusk species that are known or suspected within the District according to the Survey Protocol for S&M Terrestrial Mollusk Species version 3.0 (Feb. 2003).

Species	S&M Category	Survey Triggers			Survey Results			Buffers?
		Within Range of the Species?	Project Contains Suitable habitat?	Project may negatively affect species /habitat?	Surveys Required ?	Surveys completed ?	Sites Found?	
Vertebrates								
Larch Mountain Salamander [2] (*Plethodon larselli*)	A	No	NA [1]	NA	No	NA	NA	None
Great Gray Owl [3] (*Strix nebulosa*)	A	No	NA	NA	No	NA	NA	None
Oregon Red Tree Vole [4] (*Arborimus longicaudus*)	C	**Yes**	No	No	No	NA	NA	None
Mollusks								
Puget Oregonian [5] (*Cryptomasix devia*)	A	No	NA	NA	No	NA	NA	None

Species	S&M Category	Survey Triggers			Survey Results			Buffers?
		Within Range of the Species?	Project Contains Suitable habitat?	Project may negatively affect species /habitat?	Surveys Required ?	Surveys completed ?	Sites Found?	
Crater Lake Tightcoil [6] (*Pristiloma arcticum crateris*)	A	No	NA	NA	No	NA	NA	None

1. NA = Not applicable.
2. In the Salem District, the range of the Larch Mountain salamander is only in the very northern portion of the Cascades Resource Area, within 14 miles of the Columbia River, east of the confluence with the Sandy River according to Survey Protocols for Amphibians under the Survey & Manage Provision of the Northwest Forest Plan v3.0 (1999) pages 262 and 269.
3. In the Salem District, the range of the great gray owl is only within the Cascades Resource Area.
4. In the Salem District, pre-disturbance surveys are required for red tree voles in the North Mesic Zone which includes the project area. However, since the proposed treatment units do not contain any mature or old-growth forest patches, nor do they have 2 or more "predominant" conifer trees per acre (Survey Protocol for the Red Tree Vole, Version 2.1, October 23, 2002), surveys are not required.
5. In the Salem District, the range of *Cryptomastix devia* is limited to the Tillamook Resource Area and Clackamas County and Multnomah County in the Cascades Resource Area.
6. In the Salem District, *Pristiloma articum crateris* is suspected to occur above 2000 feet elevation in the Cascades Resource Area only.

Statement of Compliance. Within the K-Line LSR Enhancement Project there are no pre-disturbance surveys required for Survey and Manage wildlife species in order to comply with the *2001 Record of Decision and Standard and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measure Standards and Guidelines* (as the 2001 ROD was amended or modified as of March 21, 2004). There are no known Category B, D, E, and F species within the K-Line LSR Enhancement Project.

Therefore, based on the preceding information (refer to Table A above), it is my determination that the K-Line LSR Enhancement Project complies with the provisions of the *2001 Record of Decision and Standard and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measure Standards and Guidelines* (as the 2001 ROD was amended or modified as of March 21, 2004). For the foregoing reasons, this project is in compliance with the 2001 ROD as stated in Point (3) on page 14 of the January 9, 2006, Court order in Northwest Ecosystem Alliance et al. v. Rey et al.

_____ _____

Brad Keller, Field Manager
Marys Peak Resource Area

Date

2001 ROD Compliance Review: Survey & Manage Botany Species

Environmental Analysis File
Salem District Bureau of Land Management

Project Name: **K-Line** Prepared By: **Ron Exeter**

Project Type: **Commercial thinnning** Date: **Feb. 2006**

Location: **(Coast Range physiographic province) T.7 S., R.7 W., Section 31**

S&M List Date: **December 2003**

Table A. Survey & Manage Species Known and Suspected in the Salem District. Species listed below were compiled from the 2003 Annual Species Review (IM-OR-2004-034) and includes all species in which pre-disturbance surveys may be needed (Category A, C and non-fungi Category B species if the project occurs in old-growth as defined on page 79-80 of the 2001 ROD) and lists known sites of other survey and manage species that are known to occur within the project area. In addition, the table indicates whether or not a survey was required, survey results and site management.

The following survey protocols and literature were used in determining species known range, habitat and survey methodology. All field surveys were completed by intuitive controlled methods.

Fungi:
Survey Protocols for *Bridgeoporus* (=*Oxyporus*) *nobilissimus* (Version 2.0, May 1998)

Lichens:
Survey Protocols for Component 2 Lichens (Version 2.0, March 1998)
Survey Protocols for Survey and Manage Category A & C Lichens in the Northwest Forest Plan Area (Version 2.1 (2003)
2003 Amendment to the Survey Protocol for Survey and Manage Category A & C Lichens. (Version 2.1 Amendment, September 2003)

Bryophytes:
Survey Protocols for Protection Buffer Bryophytes (Version 2.0)

Vascular Plants:
Survey Protocols for Survey and Manage Strategy 2 Vascular Plants (Version 2.0, December 1998).

All species:
Rare, Threatened and Endangered Species of Oregon; Oregon Natural Heritage Information Center (May 2004).

Species	S&M Category	Survey Triggers			Survey Results			Site Management
		Within Range of the Species?	Project Contains Suitable habitat?	Project may negatively affect species/habitat?	Surveys Required?	Survey Date (month/year)	Sites Known or Found?	
Fungi								
Bridgeoporus nobilissimus[1a]	A	YES	YES	NO	YES	May, June, Sept 2004	None	N/A
Lichens								
Bryoria pseudocapillaris[1a]	A	NO	NO	NO	NO[3]	N/A	None	N/A
Bryoria spiralifera[1a]	A	NO	NO	NO	NO[3]	N/A	None	N/A
Dendriscocaulon intricatatulum[1c]	A	YES	NO	NO	NO[5]	N/A	None	N/A
Hypogymnia duplicata[1c]	C	YES	YES	NO	YES	May, June, Sept 2004	None	N/A
Leptogium cyanescens[1c]	A	YES	YES	NO	YES	May, June, Sept 2004	None	N/A
Lobaria linita var.tenuoir[1b]	A	YES	NO	NO	NO[5]	N/A	None	N/A
Nephroma occultum[1c]	C	YES	NO	NO	NO[5]	N/A	None	N/A
Niebla cephalota[1b]	A	NO	NO	NO	NO[3]	N/A	None	N/A
Pseudocyphellaria perpetua[1c]	A	NO	NO	NO	NO[4]	N/A	None	N/A
Pseudocyphellaria rainierensis[1c]	A	YES	NO	NO	NO[5]	N/A	None	N/A
Teloschistes flavicans[1a]	A	NO	NO	NO	NO[3]	N/A	None	N/A
Bryophytes								
Schistostega pennata[1b]	A	YES	YES	NO	YES	May, June, Sept 2004	None	N/A
Tetraphis geniculata[1b]	A	YES	YES	NO	YES	May, June, Sept 2004	None	N/A
Vascular Plants								
Botrychium minganense[1c]	A	NO	NO	NO	NO[6]	N/A	None	N/A
Botrychium montanum[1b]	A	NO	NO	NO	NO[6]	N/A	None	N/A
Coptis asplenifolia	A	NO	NO	NO	NO[8]	N/A	None	N/A
Coptis trifolia[1b]	A	NO	NO	NO	NO[6]	N/A	None	N/A
Corydalis aquae-gelidae[1a]	A	NO	NO	NO	NO[7]	N/A	None	N/A
Cypripedium fasciculatum[1a]	C	NO	NO	NO	NO[6]	N/A	None	N/A
Cypripediium montanum[1c]	C	NO	NO	NO	NO[6]	N/A	None	N/A
Eucephalis vialis[1a]	A	NO	NO	NO	NO[6]	N/A	None	N/A
Galium kamtschaticum	A	NO	NO	NO	NO[8]	N/A	None	N/A

Species	S&M Category	Survey Triggers			Survey Results			Site Management
		Within Range of the Species?	Project Contains Suitable habitat?	Project may negatively affect species/habitat?	Surveys Required?	Survey Date (month/year)	Sites Known or Found?	
Plantanthera orbiculata var. orbiculata	C	NO	NO	NO	NO[8]	N/A	None	N/A
Category B Species (equivalent effort surveys needed if project area includes old-growth as defined in 2001 ROD glossary, p. 79-80)								
None.[9]	B	-	NO	NO	NO[9]	N/A	None	N/A
Additional Category B, D, E & F known sites located within the proposed project Area								
Cudonia monticola	B				NO	May 2004	YES	Described below*
Gomphus kaufmannii	B				NO	Nov. 2004	YES	Described below*
Ramaria cyaneigranosa	B				NO	Nov. 2004	YES	Described below*
Rickenella swartzii	B				NO	May 2004	YES	Described below*

1 These species are former species of concern; (a) Bureau sensitive, (b) bureau assessment or (c) bureau tracking species.
2 This species is known from high elevations containing true fir and the only site in the Oregon Coast Range is at approximately 4000 feet on the top of Marys Peak. There are no true firs within the proposed project area.
3 This species known range within the NW Forest Plan is along the immediate coast or within the coastal fog zone within sight or sound of the Pacific Ocean but often extending up to 15 miles inland.
4 This species is only known from Oregon at Cape Perpetua adjacent the Pacific Ocean. There are no survey protocols available. Survey protocols were due to be completed on September 30, 2005, and fully effective September 30, 2006.
5 These species are known primarily from mature and old-growth, Doug-fir, Western Hemlock and Pacific silver-fir. Field surveys are not required if the species is not known to exist in the proposed project area or in the vicinity, and if it is determined that probable suitable habitat is unlikely to exist in the proposed project area.
6 These species are not known to occur on Bureau of Land Management lands within the Salem District. These species have no known sites in the Oregon Coast Range physiographic province.
7 This species is known to occur on Bureau of Land Management lands within the Salem District in the Cascades Resource Area. This species has known sites in the Western Cascades physiographic province but none in the Oregon Coast Range physiographic province.
8 This species is only known from western Washington. There are no known sites in Oregon.
9 Surveys are not required. The project area is less than 80 years of age and the project does not meet the definition on page 79-80 of the 2001 ROD.

STATEMENT OF COMPLIANCE: Pre-disturbance surveys and management of known sites required by protocol standards to comply with the 2001 Record of Decision and Standard and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measure Standards and Guidelines (as the 2001 ROD was amended or modified as of March 21, 2004) were completed for K-Line Commercial Thinning Project. The K-Line Commercial Thinning Project also complies with any site management for any Category B, D, and E species as identified in the 2001 ROD (as modified).

SUMMARY OF SURVEY RESULTS : The following survey and manage special attention species were located in May and November, 2004 during intuitive controlled surveys; *Cudonia monticola*, *Gomphus kaufmannii*, *Ramaria cyaneigranosa* and *Rickenella swartzii*. The management direction is to protect known sites and to minimize soil disturbance.

All of the sites were protected by excluding the known site location from any harvest consideration, and providing a 60 foot minimum protection zone. All of the sites except for the *Rickenella* site were further protected by incorporating the known site protection zones into an adjacent riparian reserve.

Therefore, based on the preceding information (refer to Table A above) regarding the status of surveys and site management for Survey & Manage botanical species, it is my determination that K-line Commercial Thinning Project complies with the provisions of the 2001 Record of Decision and Standard and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measure Standards and Guidelines (as the 2001 ROD was amended or modified as of March 21, 2004). For the foregoing reasons, this project is in compliance with the 2001 ROD as stated in Point (3) on page 14 of the January 9, 2006, Court order in Northwest Ecosystem Alliance et al. v. Rey et al.

_____ _____

Brad Keller, Field Manager Date
Marys Peak Resource Area, Salem District BLM