Beeline/McDowell Creek Thinning

(Formerly 2007 Timber Sale Thinning)

Environmental Assessment and Finding of No Significant Impact

Environmental Assessment Number OR080-06-06

March 2007

United States Department of the Interior
Bureau of Land Management
Oregon State Office
Salem District
Clackamas and Linn Counties, Oregon

T.5 S., R. 4 E. sections 3, 10, 17, 21;
T. 12 S., R.1 E., sections 21, 25, 27: W.M.

Responsible Agency:	USDI - Bureau of Land Management
Responsible Official:	Rudy Hefter, Acting Field Manager Cascades Resource Area 1717 Fabry Road SE Salem, OR 97306 (503) 375-5671
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BLM
Salem District

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

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FINDING OF NO SIGNIFICANT IMPACT

The Bureau of Land Management (BLM) has conducted an environmental analysis (Environmental Assessment Number OR080-06-06) for a proposal to thin approximately 1000 acres in two project areas located on BLM lands within the Cascades Resource Area in Clackamas and Linn Counties, Oregon. The proposed action and location for each project area is described below.

- Beeline Project Area, located in T.5 S., R. 4 E. sections 3, 10, 17, 21; WM.: Thin approximately 410 acres of 45-55 year-old timber stands: 390 acres in the Matrix land use allocation (LUA), and 20 acres in the Riparian Reserve LUA
- McDowell Creek Project Area, located in T. 12 S., R.1 E., sections 21, 25, 27: W.M.: Thin approximately 580 acres of 45 to75 year-old timber stands - 360 acres in the Matrix LUA, and 220 acres in the Riparian Reserve LUA (*EA section 2.0*).

The *Beeline/McDowell Creek Thinning Environmental Assessment* (formerly *2007 Timber Sale Thinning EA*) documents the environmental analysis of the proposed commercial thinning activities. The EA is attached to and incorporated by reference in this Finding of No Significant Impact determination (FONSI). 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). The proposed thinning activities have been designed to conform to the *Salem District Record of Decision and Resource Management Plan***,** May 1995 (RMP) and related documents which direct and provide the legal framework for management of BLM lands within the Salem District (*EA Section 1.3*).

The EA and FONSI will be made available for public review ***March 21, 2007*** to ***April 20, 2007***. The notice for public comment will be published in a legal notice in the *Molalla Pioneer* and *Albany Democrat Herald* newspapers. Written comments should be addressed to Rudy Hefter, Acting Field Manager, Cascades Resource Area, 1717 Fabry Road S.., Salem, Oregon 97306. Emailed comments may be sent to OR_Salem_Mail@blm.gov. Attention: Rudy Hefter.

Finding of No Significant Impact

Based upon review of the *Beeline/McDowell Creek Thinning 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 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 in the RMP/FEIS in the form of a new environmental impact statement is not needed. This finding is based on the following discussion, and unless otherwise specified, applies to both project areas:

Context: Potential effects resulting from the implementation of the Proposed Action have been analyzed within the context of the project area boundaries, and following fifth field watersheds: Lower Clackamas River, Lower Molalla River, Upper Molalla River and Hamilton Creek/South Santiam. The area affected by the Proposed Action is summarized in *Table1* [40 CFR 1508.27(a)]:

Table 1 - Area of 5th Field Watersheds Affected by the Proposed Action

5th Field Watershed	*Acres*	*Percent Affected by proposed activities*	*Project Area*	*Acres in Proposed Action*		
				Matrix (GFMA)	*Riparian Reserve*	*Totals*
Lower Clackamas River	117747	0.08%	Beeline	90	10	100
Lower Molalla River	92653	0.28%	Beeline	245	10	255
Upper Molalla River	129355	0.04%	Beeline	50	5	55
Hamilton Creek/South Santiam	118241	0.49%	McDowell Creek	360	220	580

Intensity:

1. The resources potentially affected by the proposed thinning activities are: vegetation and forest stand characteristics, soils, hydrology, fisheries, wildlife, air quality and fire/hazard risk, recreation, visual resources, and rural interface. The effects of commercial thinning are unlikely to have significant adverse impacts on these resources [40 CFR 1508.27(b) (1)] for the following reasons:
   - Project design features described in *(EA section 2.2.3)* would reduce the risk of effects to affected resources to be within RMP standards and guidelines and to be within the effects described in the RMP/EIS.
   - Vegetation and Forest Stand Characteristics *(EA section 3.2.1):* 1/ No special status vascular plant species or bryophytes would be affected. 2/ "Bureau Sensitive/Survey and Manage" and "Bureau Special Status (Bureau Assessment)" Species - Due to the protection buffers that have been established around each of these sites, and/or boundaries located to provide protection, no adverse effect to these species or the microclimate surrounding them is anticipated. 3/ Noxious Weeds - No significant increase in the noxious weed identified during the field surveys is expected to occur. Any increase that does occur should be short lived due to revegetation by native species in areas of high light and ground disturbing activities. 4/ No late successional stands have been identified in the affected environment.
   - Soils, Hydrology, and Fisheries *(EA sections 3.2.2-3.2.4)*: All new road construction would occur outside of riparian reserves on gentle slopes with stable, vegetated surfaces. Gentle to moderate slope gradients in this project area provide little opportunity for surface water to flow. The Stream Protection Zones (60 feet on perennial streams, 25 feet on intermittent streams) would prevent any overland flow and sediment generated by logging from reaching streams. The Stream Protection Zones would maintain the current vegetation in the primary shade zone and treatments would retain most of the current levels of shading in the secondary shade zone. Soil Compaction is limited to no more that 10% of each unit's acreage. Timber haul and road maintenance would take place during dry road conditions. Other road work (including culvert replacement) would take place during the dry season.
   - Wildlife (*EA section 3.2.5*): 1/ Existing snags, remnant old growth trees and coarse woody debris (CWD) would be retained. The few large (= 20 inches diameter and = 15 feet tall) snags that would be felled for safety or knocked over by falling and yarding operations would be retained as CWD. 2/ No suitable or dispersal habitat for any "Survey and Manage" and BLM Special Status species known or likely to be present would be lost or downgraded. Therefore, the project would not contribute to the need to list any BLM Special Status species. 3/ Thinning would not significantly change species richness (a combination of species diversity and abundance) of the Migratory and Resident Bird community.

No species would be become extirpated in stands as a result of thinning, though some less common species would be likely to enter thinned stands immediately in response to reduced canopy closure and tree density. 4/ See # 2, for effects to northern spotted owl.

- Air Quality and Fire Hazard/Risk (*EA section 3.2.6*): The thinning would result in an increased fire hazard risk from the slash but this would be mitigated by treating slash along open roads where the opportunities for ignition are greatest. After 3 to 5 years the fine fuels would be decayed in most of the units and the risk of surface fire would decrease to near current levels. The thinning itself would decrease the risk of a canopy fire. Piling and burning slash at landings and in some fuel treatment areas would have a very short duration impact on air quality, but strict adherence to smoke management regulations would result in little or no impact to the public.
- Recreation, Visual Resources and Rural Interface *(EA section 3.2.7*): Changes to the landscape character are expected to be low and would comply with Visual Resource Management guidelines. Some disturbance to vegetation would be observable after thinning activities and would be expected to return within five years. A forested setting would be maintained for recreational activities. No Rural Interface Areas are present and haul routes routinely receive log truck traffic from forest management activities by both private and public landowners. Hauling through McDowell Creek Park would be restricted on weekends and holidays.

2. The proposed thinning activities:
   - Would not affect 1/public health or safety [40 CFR 1508.27(b)(2)]; 2/unique characteristics of the geographic area [40 CFR 1508.27(b)(3)] - There are no historic or cultural resources, parklands, prime farmlands, wild and scenic rivers, wilderness, or ecologically critical areas located within the project area (*EA Section 3.1, Table 8); 3/* 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, Table 8).*
   - Are not unique or unusual. The BLM has experience implementing similar actions in similar areas without highly controversial [40 CFR 1508.27(b) (4)], highly uncertain, or unique or unknown risks [40 CFR 1508.27(b) (5)].
   - Do 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)].
   - Are not expected to adversely affect Endangered or Threatened Species listed under the Endangered Species Act (ESA) of 1973 [40 CFR 1508.27(b) (9)].
     - *Northern spotted owl:* Effects to the species are not significant because: all stands proposed for thinning would be maintained as dispersal habitat after harvest; habitat conditions are expected to improve as thinned stands mature (>20 years); Residual trees would increase in size and be available for recruitment or creation of snags, culls and CWD for prey species and nesting opportunities, particularly in Riparian Reserves.

       Except for the removal of hazard trees to protect public safety, a seasonal restriction on timber harvest and road construction (habitat modifying activities) from March 1st through June 30th would be implemented as a Conservation Measure (BO, p.97) (*EA section 3.2.5*).
     - *Fish:* Potential effects of the projects that could affect ESA listed fish species are related to sediment inputs associated with road repair/decommissioning and culvert replacement/removal. The projects would have "no effect" on Upper Willamette River (UWR) steelhead trout, UWR chinook salmon, Lower Columbia River (LCR) coho salmon, LCR Chinook salmon or LCR steelhead trout.

Consultation with NOAA Fisheries on the potential effects of the projects on those species would not be required. Although sediment would increase in the project areas in the short-term as a result of replacing live stream culverts, the effect would decrease in the long-term, having no lasting effect on fish (*EA Sections 3.1, 3.2.3*). The projects would also have no effect on Critical Habitat for the species listed above, or on Essential Fish Habitat (EFH) as designated under the Magnuson-Stevens Fishery Conservation Act. The determinations of "no effect" are based primarily on the location of the projects relative to ESA listed species distributions: In the Beeline project all of the proposed harvest units are at least three miles upstream of habitat that may be occupied by ESA listed fish species. In the McDowell Creek project all of the proposed units are at least 1.25 miles upstream of habitat that may be occupied by ESA listed fish species.

- Do not violate any known Federal, State, or local law or requirement imposed for the protection of the environment [40 CFR 1508.27(b) (10)] (*EA Section 1.3*).

3. The Interdisciplinary Team (IDT) evaluated the project areas in context of past, present and reasonably foreseeable actions [40 CFR 1508.27(b) (7)] and determined that there is a potential for cumulative effects on water quality and fisheries. The proposed action would be expected to temporarily increase stream sediment and turbidity as a result of culvert replacement, road renovation, road maintenance, road use and log fill removal. There is a theoretical potential for increases in stream sediment and turbidity as a result of thinning and logging operations (*EA Sections 3.2.2 and 3.2.3*). These effects are not expected to be significant because:
   - The DEQ has not identified any sediment problem nor determined non-compliance with the State of Oregon's water quality criteria in any stream affected by the proposed projects.
   - Increases in sediment yield from culvert replacement, road renovation, road maintenance, road use and log fill removal would be local (less than ¼ mile downstream) and short-lived (primarily in the first winter following the activity).
   - Any sediment increase resulting from thinning would be very difficult for a trained observer to detect and would decrease quickly over time, returning to current levels within three to five years as vegetation increases (Dissmeyer, 2000).
   - The limited magnitude (less than five percent of the total sixth field watershed sediment supply) and duration (primarily major storm events during the first year following disturbance) of this effect would likely be insignificant for water quality on the watershed scale. Cumulatively, the proposed action and connected actions would be unlikely to result in any detectable change for water quality on a sixth or seventh field watershed scale and would be unlikely to have any effect on any designated beneficial uses, including fisheries.

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Keith Walton, Team Lead — Date

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Leah Schofield, Team Co-Lead — Date

Reviewed by: Carolyn Sands — 3/20/07
Carolyn Sands, NEPA — Date

Approved by: Rudy Hefter — 3/20/07
Rudy Hefter, Acting Field Manager — Date
Cascades Resource Area

ENVIRONMENTAL ASSESSMENT

1.0 INTRODUCTION

1.1 Project Summary

This EA analyzes the effects of commercial thinning operations and connected actions in forest stands in two project areas as described in (*EA Sections 2.0 and 3.0).* Average stand age ranges from 45 to 75 years (*EA Section 3.2.1, 7.1 - Tables 16 & 17*) - *Vegetation Description Summaries for Each Project Area*).

The effects of thinning and connected actions in the two project areas are documented in the same environmental assessment for the following reasons:

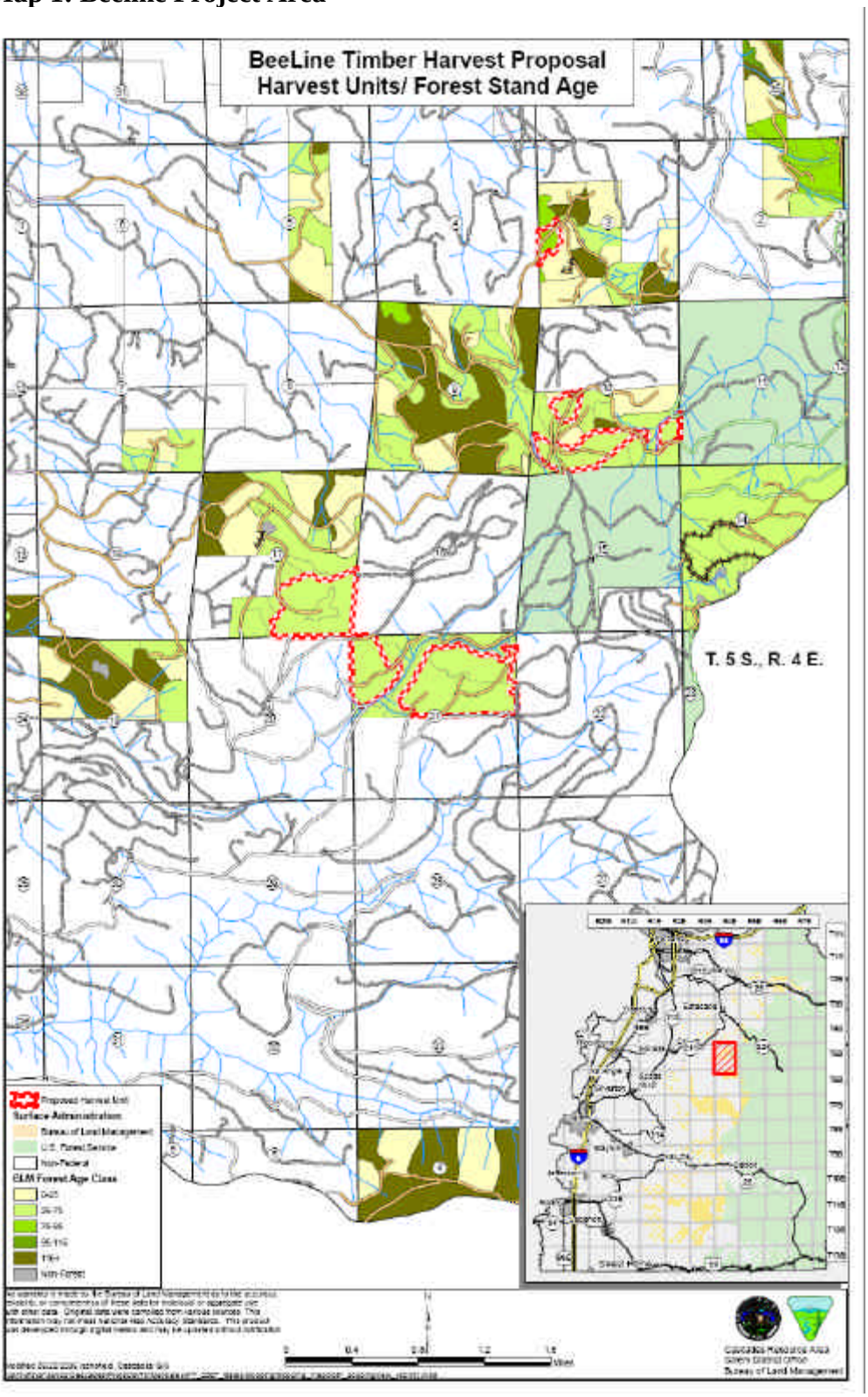
- The silvicultural prescriptions are similar for the affected Land Use Allocations in both project areas;
- The short-term and long-term effects to vegetation resulting from thinning would be generally similar;
- The influence on legacy features (snags and residual trees, and coarse woody debris) for the future stands would be similar;
- Effects resulting from road work would be similar.

1.1.1 Project Area Locations

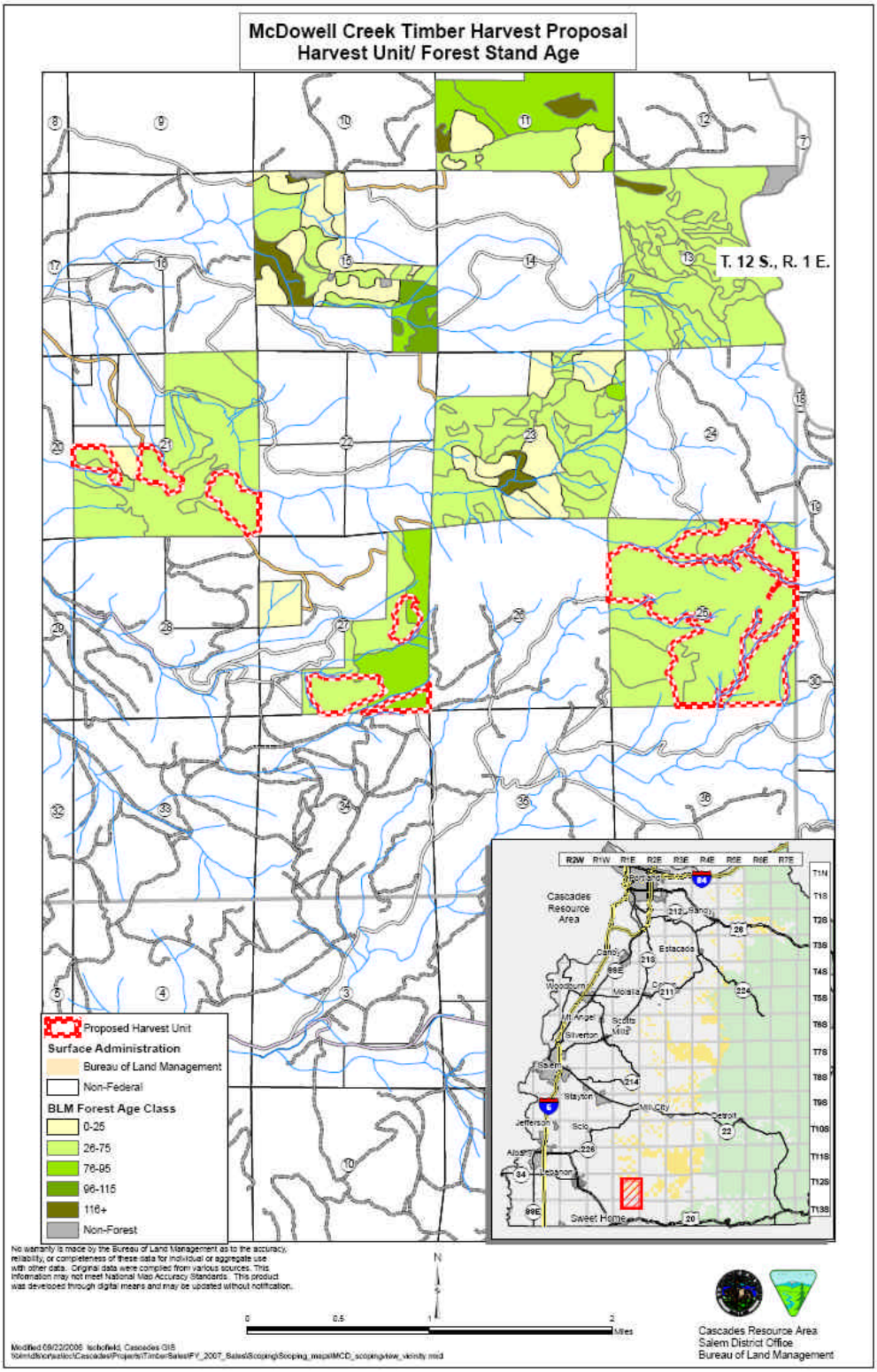
Table 2 - Project Area Locations and Affected Watersheds

Project Area	***Nearest Town and County***	***Township and Range (Willamette Meridian)***	***Sections***	***5th Field Watersheds***
Beeline	Colton, Clackamas County	5 South, 4 East	3,10	Lower Clackamas
			17,21	Lower Molalla
			21	Upper Molalla
McDowell Creek	Lebanon, Linn County	12 South, 1 East	21,25,27	Hamilton Creek/South Santiam River

Map 1: Beeline Project Area



Map 2: McDowell Creek Project Area



1.2 Purpose of and Need for Action

Data analysis and field examinations by BLM staff have identified specific stands in which growth rates will soon decline, and structural diversity is limited. The Salem BLM Resource Management Plan (RMP) describes Management Actions/Direction that may be applied to developing timber stands to attain specific resource objectives. The purpose and need for action is as follows:

- **Matrix Land Use Allocation (LUA) (RMP p. 20-22):** To manage developing timber stands in the Matrix LUA in order to:
  - Maintain the health and growth of developing stands;
  - Achieve a desirable balance between wood volume production, quality of wood, and timber value at harvest (RMP p. D-3);
  - Providing a sustainable supply of timber as described in the RMP (p. 1, 46, 47);
  - Develop timber sales that can be successfully offered to the market place;
  - Retain elements that provide ecosystem diversity (snags, old growth trees, etc.) so that a healthy forest ecosystem can be maintained with habitat to support plant and animal populations (RMP p.1, 20)
  - Increase protection for the public, facilities and high-value resources from large, intense wildfires in rural/urban interface in accordance with the National Fire Plan's Healthy Forest Initiative and Restoration Act.

- **Riparian Reserve LUA (RMP p. 9-15):** To apply silvicultural practices in some dense conifer-dominated sites within the stands of the Riparian Reserve LUA in order to:
  - Develop future large coarse woody debris, large snag habitat, in-stream large wood and other elements of late-successional forest habitat. (RMP p.1);
  - Develop structural and spatial diversity of the forest ecosystem on a landscape level in the long term.

- **Roads:** To maintain and develop a safe, efficient and environmentally sound road system **(RMP p. 62)** in order to:
  - Provide appropriate access for timber harvest, silvicultural practices, and fire protection vehicles needed to meet the objectives above;
  - Reduce potential human sources of wildfire ignition by controlling access;
  - Reduce environmental effects associated with identified existing roads within the project areas (RMP p. 11).

1.2.1 Decision Criteria/Project Objectives

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

- Meet the purpose and need of the project (*EA section 1.2*)
- Comply with the Salem District Record of Decision and Resource Management Plan, May 1995 (RMP) and related documents which direct and provide the legal framework for management of BLM lands within the Salem District (*EA section 1.3*)
- Would not have significant impact on the affected elements of the environment beyond those already anticipated and addressed in the RMP EIS.
- Be responsive to concerns for an economically efficient project.

- Select logging systems based on the suitability and economic efficiency of each system for the successful implementation of the silvicultural prescription, for protection of soil and water quality, and for meeting other land use objectives (RMP p. 47)
- Provide opportunity for adequate amounts of snags and down wood in the long term for habitat diversity
- Use the minimum transportation system to facilitate implementation of the project.
- Minimize erosion and impacts to soil productivity
- Reduce fuel hazard
- Would not contribute to the expansion of invasive/nonnative weed populations.

1.3 Conformance with Land Use Plan, Statutes, Regulations, and other Plans

The proposed commercial thinning activities in the two project areas have been designed to conform to the following documents, which direct and provide the legal framework for management of BLM lands within the Salem District:

1. *Salem District Record of Decision and Resource Management Plan***,** May 1995 (RMP): The RMP has been reviewed and it has been determined that the proposed thinning activities conform to the land use plan terms and conditions (e.g. complies with management goals, objectives, direction, standards and guidelines) as required by 43 CFR 1610.5 (BLM Handbook H1790-1). Implementing the RMP is the reason for doing these activities (RMP p.1-3);

2. *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl and Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl,* April 1994 (the Northwest Forest Plan, or NWFP);

3. *Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines,* January 2001; including any amendments or modifications in effect as of March 21, 2004;

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 decision clarifies the proper spatial and temporal scale for evaluating progress toward attainment of ACS objectives and clarifies that no project-level finding of consistency with the ACS objectives is required (ACS/ROD p. 1). Compliance with the four components of the Aquatic Conservation Strategy (ACS/ROD pp. 4, 7) is described in *EA section 3.3*. Activities within the Riparian Reserves follow the Riparian Reserve standards and guidelines (pages C-31 - C-38 of the 1994 NWFP ROD), as clarified in the ACS/ROD (pp. 1-21).

The analysis in the Beeline/McDowell Thinning 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 *Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines*, January 2001; 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 proposed thinning activities: **1/** *Molalla River Watershed Analysis,* [May, 1999]; **2/** *Upper Clear Creek Watershed* Analysis, [September, 1995]; **3/** *Lower Molalla River and Milk Creek Watershed Assessment,* [October, 2004]; **4/** *Hamilton Creek Watershed Analysis,* [March, 1995].

These documents are available for review in the Salem District Office. Additional information about the proposed activities is available in the *Beeline/McDowell Creek Thinning EA* Analysis File (BEMCAF), also available at the Salem District Office.

Survey and Manage Species Review

The Bureau of Land Management (BLM) 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. Subsequently in that case, on January 9, 2006, the Court ordered:

- 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
- reinstate 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 BLM is also aware of the November 6, 2006, Ninth Circuit Court opinion in Klamath-Siskiyou Wildlands Center et al. v. Boody et al., No. 06-35214 (CV 03-3124, District of Oregon). In Northwest Ecosystem Alliance et al. v. Rey et al the U.S. District Court modified its order on October 11, 2006, amending paragraph three of the January 9, 2006 injunction. This most recent order directs:

> "Defendants shall not authorize, allow, or permit to continue any logging or other ground-disturbing activities on projects to which the 2004 ROD applied unless such activities are in compliance with the 2001 ROD (as the 2001 ROD was amended or modified as of March 21, 2004), except that this order will not apply to:
>
> a. Thinning projects in stands younger than 80 years old;
> b. Replacing culverts on roads that are in use and part of the road system, and removing culverts if the road is temporary or to be decommissioned;
> c. Riparian and stream improvement projects where the riparian work is riparian planting, obtaining material for placing in-stream, and road or trail decommissioning; and where the stream improvement work is the placement large wood, channel and floodplain reconstruction, or removal of channel diversions; and

d. The portions of project involving hazardous fuel treatments where prescribed fire is applied. Any portion of a hazardous fuel treatment project involving commercial logging will remain subject to the survey and management requirements except for thinning of stands younger than 80 years old under subparagraph a. of this paragraph."

The Beeline and McDowell Creek Projects meet **Criterion A** above: Thinning projects in stands younger than 80 years old.

Northern Spotted Owl (NSO) Status Review:

The following information was considered in the analysis of the Beeline/McDowell Creek proposed activities: a/ *Scientific Evaluation of the Status of the Northern Spotted Owl* (Sustainable Ecosystems Institute, Courtney *et al.* 2004); b/*Status and Trends in Demography of Northern Spotted Owls, 1985-2003* (Anthony *et al.* 2004); c/ *Northern Spotted Owl Five Year Review: Summary and Evaluation* (USFWS, November 2004); and *Northwest Forest Plan – The First Ten Years (1994-2003):* d/ *Status and trend of northern spotted owl populations and habitat, PNW Station Edit Draft* (Lint, Technical Coordinator, 2005). Although the agencies anticipated a decline of NSO populations under land and resource management plans during the past decade, the reports identified greater than expected NSO population declines in Washington and northern portions of Oregon, and more stationary populations in southern Oregon and northern California.

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

Aquatic Conservation Strategy Update

The Salem District is also aware of ongoing litigation Pacific Coast Federation of Fishermen's Associations et al. v. National Marine Fisheries Service et al. (W.D. Wash.) related to the 2004 supplemental environmental impact statement for the Aquatic Conservation Strategy (ACS). The Magistrate Judge issued findings and recommendations to the court on March 29, 2006. The court has not found this amendment to be "illegal," nor did the Magistrate recommend such a finding. Given the court has not yet adopted the findings and recommendations; we will appropriately continue to follow the current direction in the 2004 ROD, until ordered otherwise.

The Beeline/McDowell environmental analysis tiers to this document as the clarification of how to address the ACS. Since it was only a clarification, and did not alter any of the on-the-ground components of the standards and guidelines designed for achieving the ACS objectives, whether the court upholds the amendment or not should have little practical effect at the project level.

2.0 ALTERNATIVES

2.1 Alternative Development

Pursuant to Section 102 (2) (E) of the National Environmental Policy Act (NEPA) of 1969, as amended, Federal agencies shall "…study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources."

For the Beeline and McDowell Creek project areas, no unresolved conflicts concerning alternative uses of available resources (section 102(2) (E) of NEPA) were identified by the Interdisciplinary Team (IDT), or the public. No alternatives were identified that would meet the purpose and need of the project and have meaningful differences in environmental effects from the Proposed Action. Therefore, this EA will analyze the effects of the "Proposed Action" and the "No Action Alternative" in these project areas.

2.2 Proposed Action

The Proposed Action is to thin approximately 1000 acres of mixed-conifer stands with ages ranging from 45 to 75 years old *(Table 3, Maps 3, 4)*. Within the General Forest Management (GFMA) portion of the Matrix LUA, units would be thinned by removing suppressed, co-dominant, and occasionally dominant trees (thinning from below), leaving residual overstory trees at a stocking level designed to provide for optimum growth, healthy stand structure and habitat requirements. Generally, the largest trees would be left.

Within the Riparian Reserve LUA, variable density management would be applied to accelerate the development of older and diverse forest conditions. Up to ten percent of the treatment area would be left in unthinned patches; small gaps (up to one acre in size, retaining approximately 20 trees per acre) would be created in 5 – 15 percent of the treatment area; and the remaining area would be thinned to a variable residual tree density, generally leaving the largest trees where structural and horizontal diversity could be enhanced. See *EA Section 7.1, tables 16 & 17* for a unit-specific summary of tree densities before and after thinning.

Approximately 58 percent of the project areas would be harvested using conventional ground-based logging equipment, and approximately 42 percent would be harvested using skyline or low-impact ground-based yarding systems.

Table 3 - Thinning Treatment Summary by Acres for the Proposed Action

Project Area	*Matrix GFMA Acres*	*RR Acres*	*Total Acres*	*Logging System (acres)*		
				Ground- based	*Skyline*	*Helicopter*
Beeline	390	20	410	170	240	0
McDowell Creek	360	220	580	480	100	0
Totals	750	240	990	650	340	0

2.2.1 Connected Actions

1. Road Work (*Table 4, EA Section 2.2.2 -Maps 3,4***):**

- ***Road Improvement*:**
  No road improvement is proposed in either of the project areas.

- ***New Road Construction*:**
  Beeline: There is no proposed new road construction in the Beeline project area.
  McDowell Creek: Approximately 0.5 miles of new road construction would occur. All new roads would be natural surface (no rock would be added).

- ***Road Renovation:*** Renovation to accommodate timber haul would include roadside brushing, blading of the road surfaces, spot rocking and cleaning culverts and ditches so drainage systems function properly.
  Beeline: Approximately 13 miles of existing road in the Beeline project area would be renovated.
  McDowell Creek: Approximately 7 miles of existing road in the McDowell Creek project area would be renovated.

- ***Culvert Installations:*** Inadequate or damaged culverts are proposed for replacement to reduce potential blockage and meet 100 year flood standards.
  Beeline: Approximately 8 culverts are proposed for replacement.
  McDowell Creek: Approximately 9 culverts are proposed for replacement.
  Following hauling activities, the existing log fill in the NE quadrant of section 25 would be removed to restore the original stream channel location and the logs used for stream structure and bank stability.

Table 4 - Summary of Proposed Road Work by Project Area

Project Area	*Road Work (Distances in miles)*					
Type	*Improvement*		*New Construction*		*Renovation*	
Surface	*Rock*	*Natural*	*Rock*	*Natural*	*Rock*	*Natural*
Beeline	0	0	0	0	13	0
McDowell Creek	0	0	0	.5	2	5
Totals	0	0	0	.5	16	5

2. Fuels Treatments

- Fuel treatments would be implemented on portions of the project areas. Treatments would include directional falling (to keep slash away from fuel breaks), followed by a reduction of logging slash in order to reduce potential for human caused ignition, and to reduce both the intensity and severity of potential wildfires in the long term (after fuels reduction has occurred). Fuels reduction would be accomplished by burning of slash piles, machine processing of slash on-site, or by a combination of these techniques. Proposed fuel treatments for the Beeline and McDowell project areas are found in *Tables 5* and *6*.

Table 5 - Proposed Fuel Treatments for Beeline

Unit	*Unit Acres*	*Primary Treatment*	*Slash Treatment Acres*	*2nd Treatment Or Option To Primary*	*WUI*
3A	14	Machine pile and burn	9	Mechanical treatment	No
10B	58	Hand or machine pile and burn	21	Mechanical treatment	No
10A	12	Directional felling in RR - Pile and burn	4	Mechanical treatment	No
10C	14	Hand or machine pile and burn	10	Mechanical treatment	No
17A	104	Directional felling	14	Hand pile and burn	No
21B	56	Directional felling	20	Pile and burn	No
Total	**258**		**78**		

Table 6 - Proposed Fuel Treatments for McDowell Creek

Unit	*Unit Acres*	*Primary Treatment*	*Slash Treatment Acres*	*2nd Treatment*	*WUI*
21B	18	Machine pile and burn Hand pile and burn	18	Directional felling	Yes
21C	21	Machine pile and burn	5	Directional felling	Yes
21E	37	Machine pile and burn	13	Directional felling	Yes
Total	**76**		**36**		

3. Blocking Unauthorized Off-Road Motor Vehicle Trails (RMP p. 41)

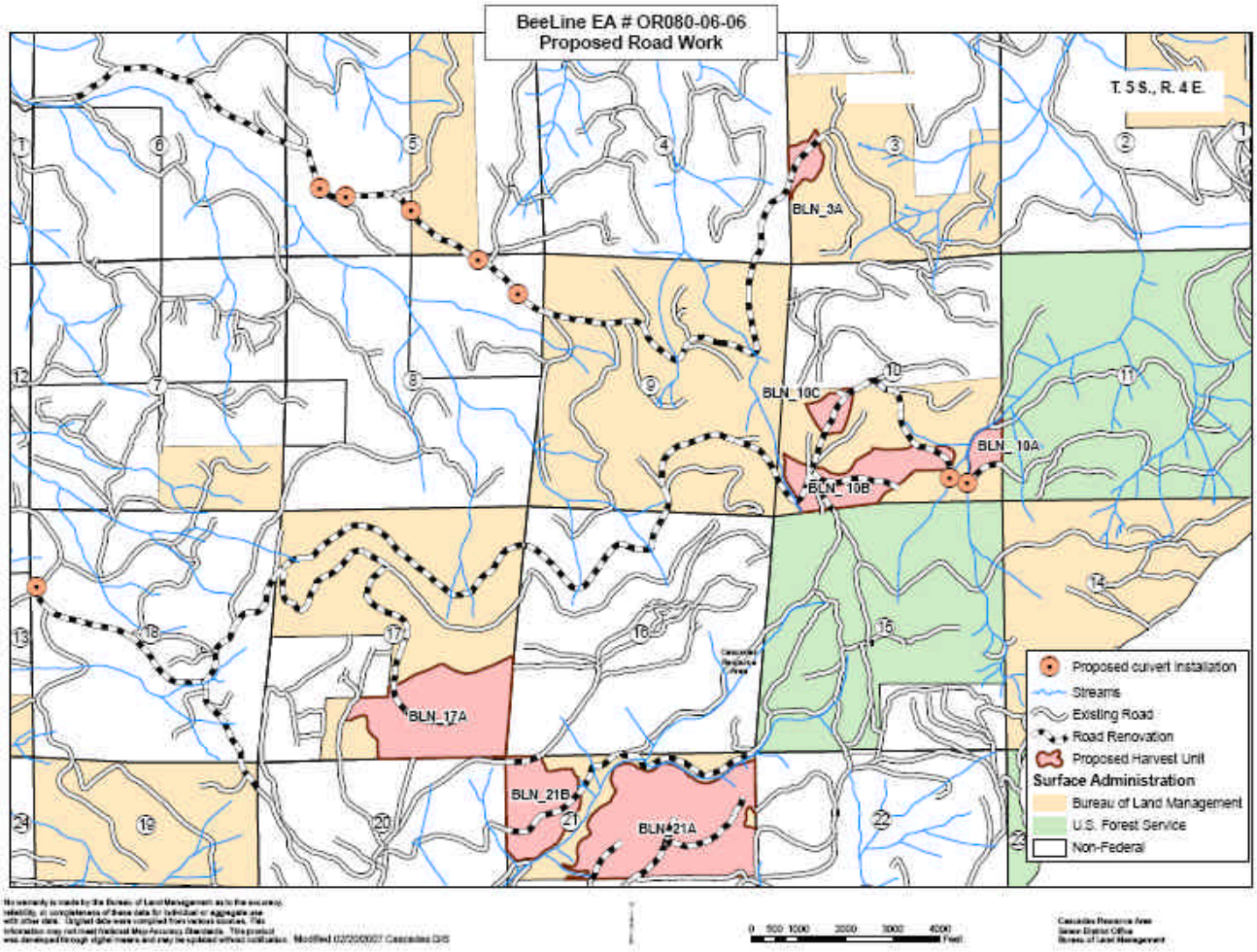
- Areas within proposed harvest units which are subject to unauthorized use by motorized vehicles would be individually evaluated to determine the best combination of treatments to stabilize and prevent further use of trails while avoiding damage to other resources.
- Skid trails and other potential access points that could result in new unauthorized use by motor vehicles would be blocked and/or made impassible.

4. Special Forest Products (SFP) (RMP p. 49)

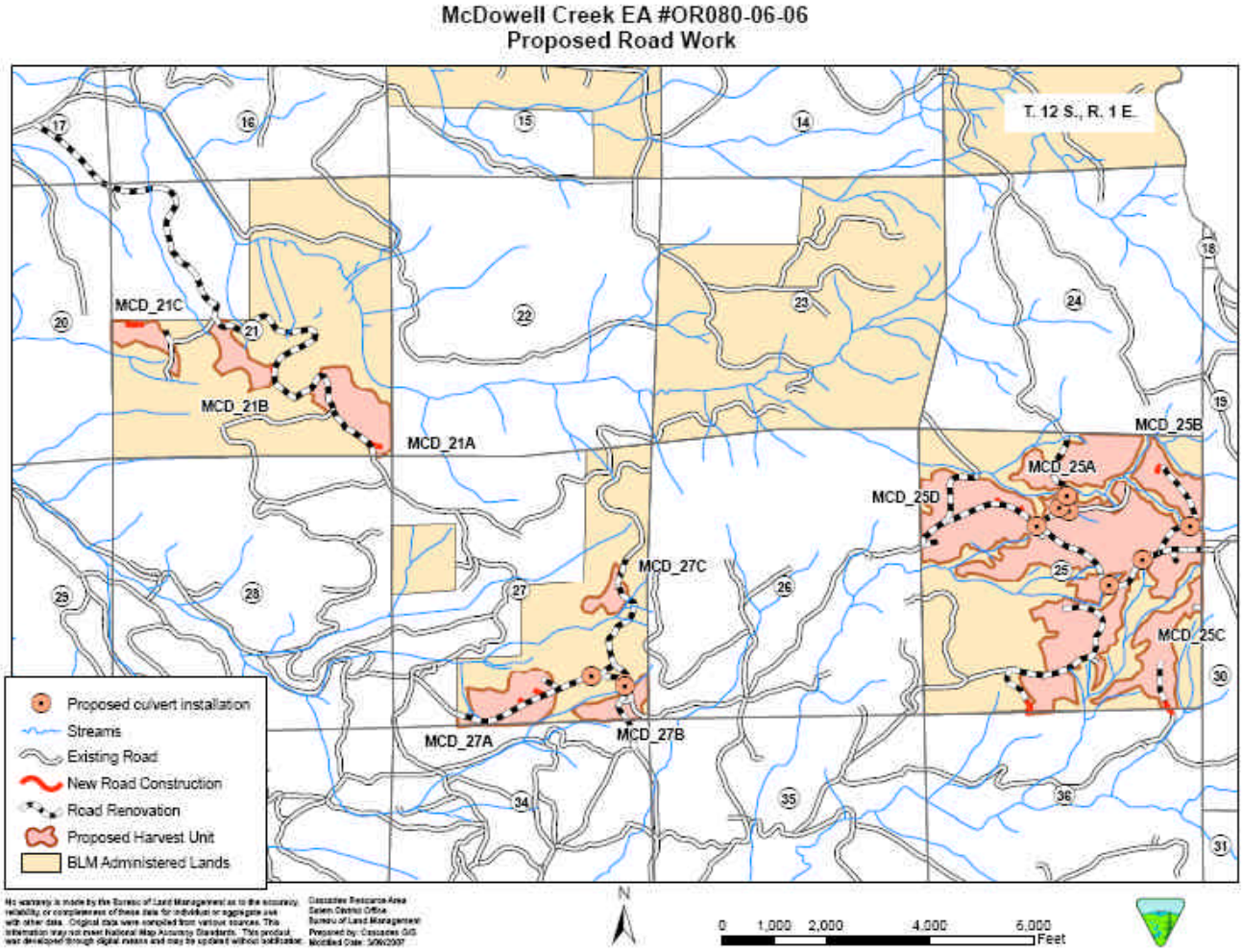
- Special Forest Products from the harvest units would be offered for harvest if market demand, product availability, and contract timing allow such offerings.

2.2.2 Maps of the Proposed Action

Map 3: Beeline Project Area



Map 4: McDowell Creek Project Area



2.2.3 Project Design Features

Design features would be implemented to reduce the risk of effects to the resources described in *Section 3.0*. Design features are organized by resource management objectives. Many of the design features contribute to achieving multiple objectives.

1. **Soil Productivity:** To maintain long term soil productivity with minimal productivity loss due to compaction, erosion and reduced fertility caused by the proposed action.
   - *All Timber Harvest Operations*:
     - Project area layout would exclude areas where operations would be expected to cause compaction or erosion greater than the levels analyzed in this EA.
     - All logging operations would utilize currently available equipment and practices that are capable of achieving the objectives of the Best Management Practices (BMP) required by law, described in the RMP, and defined by the Interdisciplinary Team of Resource Specialists (IDT) for each project.
     - All logging operations would be designed for each site to limit the area compacted to no more than ten percent of the harvest unit area.
     - All logging operations would be designed for each site to avoid concentrating runoff water flows that could cause erosion.
     - The majority of logging slash and debris would be left in place in, or returned to the harvest area to reduce erosion potential and to return nutrients and organic matter to the soil.
     - On compacted or disturbed soil, erosion control measures such as shaping to modify drainage (water bars, sloping, etc.), tilling, slash placement, and seeding with native species would be used as needed to prevent erosion that results in gullies or transporting soil more than a few feet.
   - *Skidding And Other Ground Based Logging Operations*:
     - Skidding (dragging logs behind a skidder) operations would be restricted to relatively dry soil conditions, typically mid-June through October.
     - New skid trails would be allowed on slopes not greater than 35 percent. Uphill skidding would generally be limited to slopes of 20 percent or less.
     - Skid trail locations would be evaluated and approved by the BLM before logging begins. Existing skid trails would be used whenever appropriate (feasible and meets resource objectives).
     - Mechanized falling/processing, forwarding, and shovel swing (picking up logs and "swinging" them around closer to the landing or skid trail with a log loader or processor) operations using low ground pressure tracks or tires would be limited to operating on slopes not greater than 45 percent. When not operating on approved skid trails, these machines would be required to operate on top of a slash and brush mat that would prevent all but incidental soil compaction and displacement.
   - *Skyline Yarding Operations*:
     - The leading end of all logs would be lifted off of the ground during yarding (one-end suspension) to prevent logs from plowing a groove.
     - Lateral yarding to the skyline would be used to reduce the number of skyline corridors needed and to minimize soil displacement between corridors.
     - The entire log would be suspended (full suspension) over any stream, wet area or easily impacted area that may be crossed by a skyline.

- Landing size would be limited to the minimum area needed for safe and efficient operations.

- *Other Operations*:
  - Slash and debris piles to be burned would be placed and constructed to affect the minimum area necessary for safe operations. Burning would be done after fall rains begin and the soil is wet to reduce the amount of heat imparted to the soil.
  - Slash and debris piles would not be created or burned in Riparian Reserves.

2. **Hydrologic Function, Aquatic Habitat and Fisheries:** To protect water quality, channel and bank stability, and flows.
   - *Water Quality - Sediment Generated By Logging And Roads*:
     - Design features for logging that prevent or reduce potential erosion and other soil movement, also protect water quality by preventing sediment transport to streams, wet areas and riparian areas. Equipment and methods for all logging and road operations would utilize currently available equipment and practices that are capable of achieving the objectives of the BMP required by the Federal Clean Water Act (as amended by the Water Quality Act of 1987) as well as Aquatic Conservation Strategy Objectives and other objectives described in the RMP and identified by the IDT.
     - Areas of undisturbed vegetation would be maintained between harvest areas and streams or wetlands, also known as Stream Protection Zone (SPZ).
     - All new roads and some existing roads would be stabilized or decommissioned after use to prevent erosion and reduce changes to natural drainage patterns.
       - Roads that are expected to be used in the next few years would be stabilized with water bars or other surface shaping, surface tilling, seeding with native species, sediment traps, and/or other techniques to prevent erosion. Culverts and the subgrade would be left intact.
       - Roads that are not expected to be used within the next several years would be decommissioned by removing culverts (or other stream crossing structures such as old log fill), constructing water bars or other surface shaping, re-establishing natural drainage patterns, deep tilling, seeding with native species, and/or other techniques to prevent erosion and promote infiltration of water. The material and basic structure of the subgrade would be left in place.
     - Natural surface roads that would be kept intact over winter for use the next year would be treated to prevent erosion. Typical control measures include: matting, mulching, drainage modification, seeding, sediment traps and blocking the entrance.
     - Sediment would be filtered from ditches that drain into stream crossings. Typical methods include: maintaining vegetation in the ditch and installing artificial sediment traps or filters.
     - Hauling would be restricted to times and road conditions that would not generate large amounts of sediment that could enter streams.
       - Natural surface roads – Hauling and other operations would be allowed during dry season and dry conditions only.
       - Rocked roads, not otherwise specifically restricted – Hauling would be allowed only when traffic would not "pump" fines (sand, silt and clay size particles) to the surface where they could be washed into streams by runoff.

    - ? Rocked roads, specifically restricted – Hauling would be allowed only during the dry season (typically mid-June through October) and dry conditions (McDowell Creek, roads in sections 25 and 27).
  - o Road construction, stabilizing and decommissioning would be restricted to dry weather patterns (generally summer months) and dry conditions only.
  - o Culvert removal/replacement/installation and other in-stream work would be done only during the in-stream work period established for each watershed.
- *Other Components of Hydrologic Functions, Aquatic Habitat and Fisheries (Channel, Bank, Temperature, Etc.)*:
  - o A Stream Protection Zone would be established adjacent to each stream where treatment is proposed within the Riparian Reserve. No silvicultural treatment would be done within the SPZ and no shade producing vegetation would be cut or removed.
    - ? For perennial streams, the SPZ would extend to topographic or ecological breaks, with a minimum of sixty (60) feet on each side of the channel.
    - ? For intermittent streams, the SPZ would extend to topographic or ecological breaks, with a minimum of twenty-five (25) feet on each side of the channel.
  - o Trees in the harvest unit would be directionally felled to avoid impacts to the SPZ.
  - o Roads to be constructed would be located outside of Riparian Reserves on stable ground with low to moderate slopes that do not require extensive cut-and-fill construction methods.

3. **Stand Structure, Vegetation and Wildlife Habitat:** Protect and enhance the residual stand, stand diversity, wildlife habitat components and native species.
   - Operational methods to protect the forest stand from damage would be required, including: falling and yarding would be restricted during the spring growing season when bark is easily damaged, directional falling, skid trail alignment, lateral yarding to skylines and location of burn piles to avoid heat damage to trees.
   - Old growth trees and large snags (generally at least 15 inches diameter and 15 feet tall) would be left standing to the greatest extend possible under legal safety requirements such as Occupational Safety and Health Administration (OSHA) requirements (RMP p D-2), BMP, and standard contractual logging procedures. Any snags which are cut or knocked down incidental to operations would remain on site.
   - Existing CWD would be left in place whenever feasible under standard contractual logging procedures. Skid trail location and techniques requiring minimal movement of CWD would be used to protect the integrity of CWD. Large debris would not be piled or treated during slash treatment.
   - Thinning would maintain minimum average canopy closure of 40 percent in the Matrix (GFMA) land use allocation (LUA) and 50 percent in the Riparian Reserves LUA.
   - Thinning prescriptions in the Riparian Reserves LUA would be designed to enhance stand diversity and habitat characteristics using variable density prescriptions.
   - Minor conifer tree species, hardwoods, cull/deformed trees and open grown "wolf trees" would be retained where they are uncommon.
   - Only native species and sterile mulch would be used for stabilizing disturbed soil.
   - Logging equipment would be cleaned to be free of off-site soil, plant parts and seed prior to entering the project area to prevent introducing invasive and non-native plants (RMP p. 64).

4. **Threatened, Endangered or Other Special Status Plant and Animal Species:** Minimize disturbance to federal Threatened and Endangered Species; protect, manage and conserve Special Status plants and animals and their habitats.
   - A seasonal restriction on habitat modifying operations (falling, yarding and road construction) would be implemented during the northern spotted owl nesting season. This restriction could be waived if surveys indicate no presence of nesting spotted owls within 0.5 mile of a harvest unit.
   - Operations may be restricted or shut down at any time if plant or animal populations that need protection are found (RMP p. 29).
   - Plant species/populations requiring protection would be buffered with no treatment buffers or unit boundary adjustments that exclude them from treatment areas.

5. **Fire and Air Quality:** Reduce long term risk of wildfire and protect air quality.
   - All burning would occur under favorable smoke dispersal conditions in compliance with the Oregon Smoke Management Plan (RMP p. 22, 65). Burning would take place in the fall after the winter rains begin.
   - Some roads would be gated or closed to reduce fire risk instead of treating fuels adjacent to those roads.
   - Large woody debris would not be piled.

6. **Rural Interface and Recreation:** Reduce potential hazards to rural interface and high-use recreation areas.
   - Signs and road control would be required where necessary to ensure public safety while thinning, hauling and fuel treatment activities are occurring.
   - No hauling would be allowed through high-use recreation areas (e.g. McDowell Creek Park) on weekends and holidays.

7. **Cultural Resources:** Protect cultural resources.
   - Operations would be restricted or shut down as needed to protect cultural resources that are found in the project area (RMP p. 36).

Table 7 - Summary of Seasonal Restrictions and Permitted Operational Periods

Seasonal Restriction	*Reason*	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*
Most logging operations and road work	Owl nesting			■	■	■	■						
Falling and yarding	Bark slippage			▒	▒	■	■	▒					
Tractor operations	Soil damage	■	■	■	■	■				▒	▒	▒	■
Road Construction / Decommissioning	Soil damage/erosion control	■	■	■	■	▒				▒	▒	▒	■
In-water work, roads[1]	Protect fish species	■	■	■	■	■	▒	▒		▒	■	■	■

Key	Operations generally allowed.	Operations typically dependent on conditions.	Operations generally not allowed.

[1] Includes live stream culvert replacement, see *EA Section 7.1, Table 18* for in-water work period for specific watersheds

2.3 No Action Alternative

The Proposed Action and connected actions would not be implemented. Management activities and other uses (e.g. road use, road maintenance, harvest of special forest products on public land) would continue on BLM and non-federal lands within and adjacent to the project area according to plans for those areas. This alternative also serves to set the environmental baseline for comparing effects to the Proposed Action.

2.4 Alternatives Considered Yet Not Analyzed In Detail

Regeneration Harvest

The RMP provides for regeneration harvest at Culmination of Mean Annual Increment (CMAI), at an approximate stand age of 80 years. None of the stands considered in this proposed action meet that criterion.

Variable Density Thinning

The primary functions of the Matrix land-use allocation are the production of timber and other commodities, and providing for connectivity to support dispersal between reserves and providing habitat for species associated with both late successional and younger forests. Variable density thinning (VDT) of forest stands is appropriate in land-use allocations designed to provide greater ecological diversity, owl nesting, foraging, and roosting habitat such as Late Successional Reserves (LSR) and Riparian Reserves (RR), but does not achieve these objectives as well as the proposed prescription.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS

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 8 (*Critical Elements of the Environment) and *Table 9* (Other Elements of the Environment) summarize the results of that review. Affected elements are **bold**. All entries apply to the action alternatives, unless otherwise noted.

Table 8 - Review of Critical Elements of the Environment (BLM H-1790-1, Appendix 5)

Critical Elements Of The Environment		***Status: (I.E., Not Present , Not Affected, Or Affected)***	***Does this project contribute to cumulative effects? Yes/No***	***Remarks If not affected, why?***
Air Quality (Clean Air Act)		**Affected**	**No**	**Addressed in text (Section 3.2.6)**
Areas of Critical Environmental Concern		Not Present	No	
Cultural Resources		Not Present	No	No cultural resources were located during surveys. Addressed in text (Section 5.2.1)
Adverse Impacts on the National Energy Policy (Executive Order 13212)		Not Present	No	
Environmental Justice (Executive Order 12898)		Not Present	No	
Prime or Unique Farm Lands		Not Present	No	
Flood Plains (Executive Order 11988)		Not Present	No	
Hazardous or Solid Wastes		Not Present	No	
Invasive, Nonnative Species (plants) (Executive Order 13112)		**Affected**	**No**	**Addressed in text (Section 3.2.1)**
Native American Religious Concerns		Not Present	No	No known Native American religious sites are in the project area. Addressed in text (Section 5.2.1)
Threatened or Endangered (T/E) Species or Habitat	**Fish**	Not Present	No	
	Plant	Not Present	No	
	Wildlife (including designated Critical Habitat)	**Affected**	No	**Addressed in text (Section 3.2.5)**
Water Quality (Surface and Ground)		**Affected**	**Yes**	**Addressed in text (Section 3.2.2)**
Wetlands (Executive Order 11990)		Not Present	No	
Wild and Scenic Rivers		Not Present	No	
Wilderness		Not Present	No	

Table 9 - 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 If not affected, why?*
Fire Hazard/Risk		**Affected**	**No**	**Addressed in text (Section 3.2.6)**
Other Fish Species with Bureau Status and Essential Fish Habitat (RMP p. 29)		Not Present	No	No fish species with Bureau Status are found within the project areas. Thinning and connected actions in the project areas would have no effect on Essential Fish Habitat (EFH) as designated under Magnuson-Stevens Fishery Management Act because no EFH exists within the project areas.
Land Uses (right-of-ways, permits, etc)		Not Affected	No	
Late Successional and Old Growth Habitat		Not Present	No	Stands proposed for thinning are not functioning as late-successional old growth habitat.
Mineral Resources		Not Present		
Recreation		**Affected**	**No**	**Addressed in text (Section 3.2.7)**
Rural Interface Areas		**Affected**	**No**	**Addressed in text (Section 3.2.7)**
Soils		**Affected**	**No**	**Addressed in text (Section 3.2.4)**
Special Areas outside ACECs (Within or Adjacent) (RMP p. 33-35)		Not Present	No	
Other Special Status Species / Habitat	**Plants**	**Affected**	**No**	**Addressed in text (Section 3.2.1)**
	Wildlife	**Affected**	**No**	**Addressed in text (Section 3.2.5)**
Visual Resources		Not Affected	No	Addressed in text (Section 3.2.7)
Water Resources – Other (303d listed streams, DEQ 319 assessment, Downstream Beneficial Uses; water quantity, Key watershed, Municipal and Domestic)		**Affected**	**No**	**Addressed in text (Section 3.2.2)**
Wildlife Structural or Habitat Components - Snags/CWD/ Special Habitats, road densities		**Affected**	**No**	**Addressed in text (Section 3.2.5)**

The resources affected by the proposed thinning activities are: vegetation and forest stand characteristics, soils, hydrology, fisheries, wildlife, air quality and fire/hazard risk, recreation, visual resources, and rural interface. *EA Section 3.2* describes the current condition and trend of the affected resources and the environmental effects of the alternatives on those resources.

3.2 Affected Environment and Environmental Effects

In most cases the descriptions of the affected environment and environmental effects apply to both project areas. Characteristics unique to each project area are described separately.

3.2.1 Vegetation and Forest Stand Characteristics

Source*: Beeline Silvicultural Prescriptions – 2007 Timber Sale Thinning EA; McDowell Creek Silvicultural Prescriptions – 2007 Timber Sale Thinning EA; Cascade Resource Area Botanical Report – 2007 Timber Sale EA; 2007 Timber Sale Thinning EA-Wildlife report.*

Affected Environment

Stand Characteristics and History:

In general, the mature/old growth forest stands in both project areas were clearcut logged in the 1930's through early 1960's. Little evidence of the previous stands are now visible except for the scattered concentrations of CWD/cull material that wasn't considered valuable enough at the time to haul away. Forestry practices that were applied to these stands include clearcutting, broadcast burning and soil scarification to remove slash and prepare for regeneration. Most of this area was tractor logged with tractor trails still evident throughout. With the intentions to maximize timber production, the area was treated with a mix of seeding, natural regeneration and planted with Douglas-fir seedlings, followed by herbicide applications, fertilization, animal damage control and pre-commercial thinning to ensure survival and rapid tree development.

Most stands are mixed conifer predominately Douglas-fir and western hemlock ranging from 45-75 years of age, closely spaced and exhibiting a simple stand structure. The stands are lacking species diversity, ground cover, deciduous shrub understory layers, and lacking structural diversity, especially large remnant overstory trees. Other species such as bigleaf maple constitute a small portion of the canopy composition in some stands. Canopies are generally closed (70-90 percent), and understory vegetation is sparse because of limited light reaching the forest floor. The understory that is present consists mostly of scattered sword fern, vine maple, Oregon grape, rhododendron and salal. There are very few suppressed understory conifers present.

Residual old growth trees are rare or non-existent in the Beeline project area and are in very low numbers in the McDowell Creek project area. Coarse woody debris (CWD) that would meet RMP requirements is currently lacking in all of the areas proposed for thinning. The younger stands have few if any residual snags or hard, large down woody material.

There are occasional small patches of *Phellinus weirii* (laminated root rot) as indicated by down and dying trees.

Threatened/Endangered/Special Status/Special Attention/Survey & Manage Species:

Comprehensive botanical inventories of the proposed project areas were conducted in May through October 2005, and June and July 2006. No Threatened & Endangered, Bureau Special Status, Special Attention or Survey & Manage vascular plants or bryophytes were found in the area proposed for treatment during record searches or field surveys.

Surveys did locate one Bureau Sensitive fungus, *Bridgeoporus nobilissimus,* and one Bureau Special Status lichen species, *Pseudocyphellaria mallota.*

Beeline

Bridgeoporus nobilissimus a Bureau Sensitive/ Survey and Manage Category A fungi species was identified within the project area and its vicinity in sections 10, 17 & 21 (Cascade Resource Area Botanical Report – 2007 Timber Sale EA*)*.

McDowell

Pseudocyphellaria mallota, a Bureau Special Status (Bureau Assessment) lichen species was identified within the boundaries of the project area in unit 27-C.

Cimicifuga elata, (tall bugbane), a Bureau Sensitive vascular plant was identified adjacent to units 21-C and E in two locations along road 12-1E-17.2. All known populations are outside of proposed thinning units.

Invasive/ Non-Native Species:

The following invasive/non-native species were found to occur within or adjacent to both project areas; tansy ragwort (*Senecio jacobaea*), bull thistle (*Cirsium vulgare*), Canadian thistle (*Cirsium arvense*), St. John's wort (*Hypericum perforatum*), and scotch broom (*Cytisus scoparius*). Specifically to Beeline, orange hawkweed (*Hieracium aurantiacum*) was found, and specific to the McDowell Creek project area is false brome (*Brachypodium sylvaticum*). The distributions of all these species are found primarily within the existing road prisms and past landing sites.

A Noxious Weed Risk Assessment of the project areas was conducted and found to have a risk rating of moderate (Cascade Resource Area Botanical Report – 2007 Timber Sale EA). A moderate rating indicates the proposed project could proceed as planned with measures in place to control and/or prevent the establishment of invasive/non-native plant species in areas of ground disturbance.

Environmental Effects

3.2.1.1 Proposed Action

Vegetation and Forest Stand Characteristics

Matrix (GFMA): Thinning would increase average stand diameter growth by reducing competition for water, light and nutrients, and concentrate future growth on fewer trees to develop larger-diameter dominant and co-dominant trees compared to an unthinned stand. Thinning these stands at this time would slow crown recession, leading to the development of larger crowns and larger limbs as they grow into the spaces left after harvest has occurred. Less-dense wood (wider growth rings) and a higher proportion of wood with large knots in the live crown would be expected to develop throughout the thinned areas compared to the No Action Alternative. Areas thinned for the first time would be expected to develop these characteristics faster than untreated areas.

Spacing of residual trees would be more or less uniform throughout the treatment area. Understory and ground cover species would increase in vigor, variety, and structural complexity with the additional light reaching the forest floor (*See photos 1-4*). *Phellinus weirii* (laminated root rot) pockets would continue to spread, creating and enlarging canopy gaps over the next few decades. The forest canopy would be expected to close again in 10-20 years.

Riparian Reserves (RR): Thinning prescriptions specific to this LUA would result in a wide range of residual tree densities. Canopy gaps and unthinned patches would result in immediate overstory spacing diversity. Understory and ground cover would remain sparse in unthinned patches, and vigorous dense shrub patches would develop in heavily-thinned patches, resulting in an enhanced layer effect to the canopy and understory. The proposed action and associated design features would promote the growth of large trees faster, and provide a renewable supply of snags and CWD. Existing conifer regeneration would be enhanced in areas where gaps are created, and new conifer regeneration would be initiated by natural seeding.

Future entries may be needed to maintain or further enhance structural and horizontal diversity within stands. The increased growth in these stands would be expected to develop tree size and crown characteristics associated with mature and late-successional forest more quickly than untreated forest stands in the area.

The photos indicate the visual differences in stand characteristics that typically result from thinning prescriptions proposed in the Matrix LUA of all project areas. All photos were taken from edge of road.

Photo 1: *Current Dense Stand before treatment. Note dead vine maple and very little understory.*

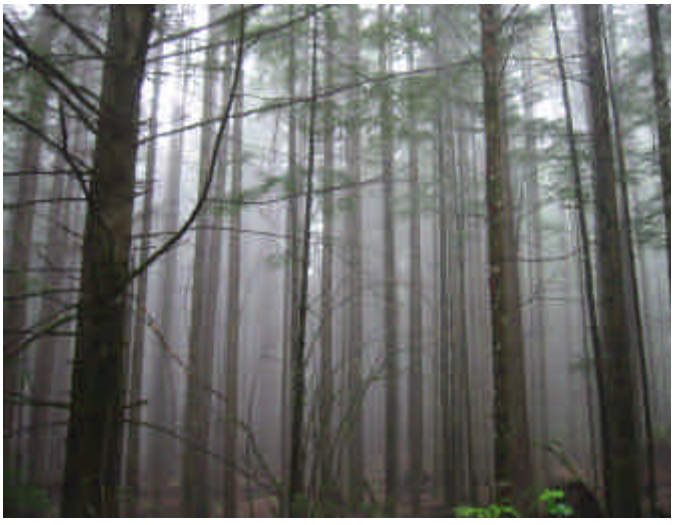


Photo 2: *One year after treatment adjacent private land. Note understory developing.*

Photo 3: *Dense canopy view before thinning treatment.*

Photo 4: *Canopy view after thinning treatment, example of tree crown spacing.*

Threatened/Endangered/Special Status/Special Attention/Survey & Manage Plant Species:

The proposed project would have no effect on any Threatened or Endangered Species *(see Affected Environment1)*, nor would it contribute to the need to list any Special Status/Special Attention/Survey & Manage Species known or expected to occur in the vicinity of the project area. If any previously undiscovered SEIS Special Status, Special Attention or Survey & Manage Species are discovered on site, appropriate mitigation would be implemented as described on pages 2-41 and 2-86 of the RMP.

Beeline Project Area

Bridgeoporus nobilissimus: A 50 foot radius buffer around each viable fruiting body would adequately protect the fruiting body and its substrate and habitat from disturbance associated with the proposed project. Since all of the viable fruiting bodies found would be excluded from harvest areas or buffered with a minimum 50 feet no treatment area, there would be no direct impact to the fruiting bodies. Therefore, the species would remain viable.

McDowell Creek Project Area

Pseudocyphellaria mallota: The buffer around the host tree would adequately protect the lichen and its substrate from disturbance associated with the proposed project, so there would be no anticipated impact on the identified population.

*Cimicifuga elata (*tall bugbane): The *C. elata* locations are outside the proposed project area. No impact to these populations is anticipated.

Invasive /Non-native Plant Species (Including Noxious weeds):

No adverse effects from invasive/non-native species would be anticipated. Observations in previous thinnings have not identified increases or expansion of existing populations. Design features would reduce the risk of any spread of new populations of noxious weeds as a result of the Proposed Action and expansions are expected to be very minimal. Roadside populations of noxious weeds could increase in vigor in the short term as more sunlight reaches the forest floor after treatment. Any plants spread from roadside to interior would remain low-vigor or die out completely and would not be expected to compete successfully with native species. As the canopy closes over the next 20 years, it is anticipated that any populations in the project areas would be shaded-out and be reduced to low-vigor populations. Design features would prevent the introduction of new weeds from off site.

3.2.1.2 No Action Alternative

Vegetation and Forest Stand Characteristics (all LUAs):

Without thinning, crowns would be expected to recede (as lower limbs are shaded out and die) over the next 10 to 20 years, reducing the live crown ratio and slowing growth rates on the trees.

Average tree size would continue to increase, but at a slower rate as competition for light and nutrients increases. Suppression mortality of smaller and weaker trees in the stand would be expected. Declining vigor in understory and ground cover species would be expected with increased shading from the closed canopy. Denser wood (narrower growth rings) and longer clear boles (tree trunk) would develop, compared to the Proposed Action.

Threatened/Endangered/Special Status/Special Attention/Survey & Manage Species*:*

Habitat conditions for *Bridgeoporus nobilissimus*, *Pseudocyphellaria mallota*, and *Cimecefuga elata* populations would remain unchanged.

Invasive / Non-native Plant Species (including Noxious Weeds):

Without any new human caused disturbances in the proposed project areas, established invasive/non-native species population numbers would remain at or near current levels. The existing populations are currently being managed under the *(Cascades Resource Area Invasive Non-Native Plant Management EA, #OR-080-02-02).*

3.2.2 Hydrology

Source: *2007 Beeline Hydrology/Channels/Water quality report, and; 2007 McDowell Creek Hydrology/Channels/Water quality report*

Affected Environment

Site surveys in the proposed project areas indicate that the streams are in proper functioning condition. No wetland/pond complexes were identified within proposed treatment units. Streams in the project areas are similar to other western Cascades streams where highest discharge takes place during winter storm events. Summer base-flow normally begins in perennial channels sometime in July and continues through October. Many small headwater channels dry up completely during this period.

Several existing culverts in the proposed project area are undersized (not large enough to function in 100 year flow event) and must have their inlets cleaned frequently to prevent overflow that would cause erosion and could cause catastrophic failure and mass wasting.

Beeline Project Area

The project area is located in five separate 7th field watersheds with approximately 16,118 acres (25.2 miles^2) in combined drainage area. The proposed units drain into the Molalla-Pudding and Clackamas River. Water providers that utilize water from the project watersheds as a source for drinking water are the Colton Water District, City of Molalla, Canby Utility Board and Clackamas Water Board. There are no key watersheds in the project area.

Oregon Department of Environmental Quality (ODEQ) identified the project watersheds as having potential general water quality problems (moderate based on observations). The Molalla River is listed by ODEQ for exceeding summer stream temperature from river mile 0 to 48.2 and for exceeding fecal coliform thresholds from river mile 0 to 25. These reaches are several miles below the project area. Field survey data also indicate that shading along perennial streams is near to full potential on public lands in the project area with canopy closure exceeding 80% along most stream reaches. The ODEQ has not identified any groundwater pollution problems within project watersheds.

Eight culverts have been identified as not meeting standards.

McDowell Creek Project Area

The project area contains several small headwater streams tributary to the Hamilton and McDowell Creeks in the South Santiam watershed. The City of Lebanon withdraws water from the South Santiam River several miles downstream from the project area. None of the project area streams are designated as Wild and Scenic, and there are no key watersheds in the project area.

ODEQ identified the project watersheds as having potential general water quality problems. Moderate water quality problems were identified in lower Hamilton Creek. Both Hamilton and McDowell Creeks are listed for not meeting summer stream temperature standards. Listed segments are all more than one mile downstream of project areas. Neither stream was listed for failure to meet water quality standards for turbidity or fine sediment.

Field survey data indicate that shading is near to full potential along the perennial streams on public lands in the project area with canopy closure exceeding 80% along most stream reaches. ODEQ has not identified any groundwater pollution problems within project watersheds.

Nine culverts have been identified as not meeting standards. One log fill stream crossing in the NE¼ of section 25 blocks the stream channel completely, though water is currently flowing through it between logs.

Environmental Effects

3.2.2.1 Proposed Action

Detrimental effects (beyond one year) to watershed hydrology, channel morphology, and water quality as a result of the proposed action are unlikely. This action is unlikely to permanently alter the aquatic system either by affecting its physical integrity, water quality, sediment regime or stream-flow. The long term effects of the proposal may be slightly beneficial for the aquatic system as a result of increased wood recruitment and species and structural diversity in the riparian zone.

The proposed culvert replacement and log fill removal would result in small (limited to the road right-of-way), short term (less than one year to two years) alteration of channels. Overall, this proposal is unlikely to have any detectable effect on stream temperatures, pH, or dissolved oxygen.

Watershed Hydrology:

- *Ground Water:* It is unlikely that the proposal would result in any detectable change to local ground water (see Hydrology report pp. 27). The proposal would remove less than half the existing forest cover and the root systems of the retained conifers would quickly use any additional moisture available in the soil. Proposed road construction would not involve excavation into side slopes where water tables could be intercepted.

- *Base Flow:* It is unlikely the proposal would result in any detectable change to local base flow, because the proposed project would remove less than half the existing forest cover, so that the root systems of the retained conifers would quickly use any additional soil moisture available.

- *Peak Flow Effects from Harvest:* Since portions of the project area are in a zone subject to transient snow accumulations in the winter, it can be assumed that the reduction in stand density may result in some small increase in snow accumulation and melting during rain-on-snow (ROS) events. However, because canopy closure would not be reduced below 30 percent, this effect is not likely to result in detectable changes to snow melt and peak flows in these watersheds.

- *Peak Flow Effects From New Road Construction:* New road construction under the proposed action would be limited to moderate slopes, and would not require extensive cut-and-fill construction.

This is unlikely to have a detectable effect on peak flows because there would be no interception of surface or ground water with routing to stream channels.

- *Peak Flow Effects from Existing Roads:* There would be no change in road surface drainage as a result of the proposed action. Therefore, this proposal would not alter existing roads in a way that would likely reduce or increase any existing effect to peak flows, or change current conditions and trends relative to hydrology and stream flows.

Stream Channel Morphology (Physical Integrity):

With the exception of replacing culverts and removing the log fill at stream crossings, there would be no direct alteration of any stream channel, or morphological feature. All other logging and other equipment operations and disturbances would be at least 25 feet from all intermittent stream channels, and 60 feet from perennial stream channels. Therefore, current channel morphology would be protected.

Physical integrity of banks and channels at existing stream crossings would be altered for one to several years following culvert replacement. Within the road prism (estimated at 30 feet typical width) the banks and bed would be excavated to remove and replace the culvert, then re-compacted (bulk density of soils increased by as much as 30%). Any existing vegetation within the road prism would be removed, leaving exposed soil until the native species seed, which would be applied to the exposed soil, revegetates the site. The existing culvert bed and less than ten feet of channel at each end of the installed culvert would be excavated and shaped during replacement. In summary, there would be no net change to the existing basic structure of the stream banks and channel, except during culvert replacement operations.

Due to the stable nature of channels at these locations little to no additional disturbance to channel morphology would be expected either upstream or downstream from the crossing. In the long term, upgrading culverts to the 100 year flood standards would reduce potential for crossing failure during extremely high flows or as a result of blocking the culvert inlet.

Where the log fill is proposed to be removed (McDowell Creek, section 25) after use, the channel would be disturbed then restored to a natural, stable form. Native species seed applied to bare soils would stabilize these soils within a few months. Using the logs for bank stability and stream channel structure would enhance overall stability.

Water Quality

- *Sediment:* Sediment transport and turbidity in the affected watersheds may increase within the first year or two as a direct result of road repair and construction, together with hauling and yarding in and around riparian zones (see Hydrology report pp. 21-26). Over the long-term (beyond two years), conditions and trends in turbidity and sediment yield would return to pre-project conditions.

  Tree removal and road renovation and construction would not occur on steep unstable slopes where the potential for mass wasting adjacent to stream reaches is high.

Therefore, increases in sediment delivery to streams due to mass wasting are unlikely to result from this action.

Implementing Best Management Practices (BMPs) (RMP Appendix C, pp. C-1 to C-9), as adapted by the IDTs for these projects, would reduce the potential for detectable sediment delivery to streams as a result of tree harvest, road construction, maintenance and use. Examples of BMPs to be implemented for this proposal include stream and road buffers, minimum road widths, minimal excavation, ensuring appropriate drainage from road sites, and seasonal limitations on road use and ground based harvest operations *(EA section 2.2.3).*

- *Temperature:* The proposed action would comply with the requirements of the Oregon Department of Environmental Quality's (ODEQ) Draft Willamette Total Maximum Daily Load (TMDL) (http://www.deq.state.or.us/wq/willamette/WRBHome.htm) for the maintenance of and/or increase in effective shade adjacent to perennial streams. No shade producing vegetation within the "primary shade zone" (estimated to be no more than 60 feet from the active stream channel) of perennial streams would be cut or removed.

  Canopy closure in the secondary shade zone would be reduced to no less than 50% and therefore, following the BLM/USFS Sufficiency Analysis for Stream Temperature (U.S. Forest Service and Bureau of Land Management. 2004. ***Northwest Forest Plan Temperature TMDL Implementation Strategies***. Draft. Portland, Oregon. p. 19), shade loss would be too small to affect stream temperature (see Hydrology report p. 21).

Cumulative Effects

Since the proposal is not likely to result in measurable direct or indirect effects to stream flow the proposal would be unlikely to contribute to any potential cumulative effects to either annual flow, base flow, flow timing or peak flows in these watersheds (Hydrology report p.19). The proposal would result in no net increase in forest openings in Transient Snow Zone with crown closure <30% and therefore would not contribute cumulatively to peak flow augmentation that may be occurring in these watersheds as a result of forest harvest. Proposed road use and construction is unlikely to alter surface or subsurface hydrology or to contribute cumulatively to any change in the watershed base, peak or annual flow.

This action could contribute cumulatively to accelerated sediment loads observed in the watershed; however, it would be very difficult for a trained field observer with field equipment to detect (see Hydrology report pp. 26-27). Typically, sediment yields from forest harvest decrease over time as a negative exponential (Dissmeyer, 2000). The quantity of surface erosion with delivery of sediment during large storm events would likely drop back to current levels (estimated at 0.240 tons/ac) within three to five years as the remaining forest stand fills out and skid roads recover.

In a similar manner, the risk of short term increases in stream turbidity as a result of road repair and hauling would likely contribute to direct increase in turbidity levels directly below road/stream intersections. Increases in sediment yield from culvert replacement, road renovation, road maintenance, road use and log fill removal would be local (less than ¼ mile downstream) and short-lived (primarily in the first winter following the activity). Cumulatively, the proposed action and connected actions would be unlikely to result in any detectable change for water quality on a sixth or seventh field watershed scale and would be unlikely to have any effect on any designated beneficial uses, including fisheries.

Over the long term, the incremental improvement of forest stand characteristics (increased species diversity and wood recruitment) in the riparian would support the cumulative improvement in these conditions that is anticipated throughout these watersheds in response to the forest plan. This would add cumulatively to the improvement in the condition of stream channels in the watershed.

3.2.2.2 No Action Alternative

The "no action" alternative would result in the continuation of current conditions and trends at this site as described in the Description of the Affected Resource section of this report. Cumulative effects to the watershed would continue to occur from the development of private and other agency lands (primarily timber harvesting and road building). Undersized culverts or the log fill in the McDowell Creek project could plug and overflow and erode the road surface (generating sediment) or fail catastrophically (causing mass wasting).

3.2.3 Fisheries and Aquatic Habitat

Source: *2007 Timber Sale Thinning EA - Fisheries and Aquatic Habitat* (Fisheries Report)

Affected Environment

Beeline Project Area

Generally, streams within the project area are moderate to high-gradient (4-10%), confined, boulder dominated channels with well-vegetated, stable banks. Large woody debris (LWD) loading levels are low, and potential future recruitment of LWD is low due to the age (~45-55 years), small diameter (avg. dbh <15") and composition (high proportion of hardwoods) of riparian stands of trees. Streams are generally well shaded by closed canopies provided by coniferous and deciduous trees.

Few fish-bearing streams exist within the project area adjacent to proposed thinning units. The stream that forms the west boundary of Unit 10C has a higher gradient than is generally considered capable of supporting fish, but is assumed to be fish-bearing because it is the outlet of Clear Lake which was known historically to support a population of cutthroat trout (*Oncorhynchus clarki*), and may support brook trout (*Salvelinus fontinalis*) as a result of stocking by the ODFW in the 1970s. The stream that flows between Units 21A and 21B supports cutthroat trout. All other streams within the project area are small, steep headwater channels, not capable of supporting fish. Eight culverts in this project area have been identified as undersized.

- **Threatened & Endangered Species:** The Beeline project is located in two 5th field watersheds**,** the Lower Molalla River and the Lower Clackamas River. In the Lower Molalla River watershed Upper Willamette River (UWR) steelhead trout may be present in the Canyon Creek and Upper Milk Creek 6th field watersheds and UWR chinook salmon are present in the Molalla River farther below the project area. In the Lower Clackamas River watershed Lower Columbia River (LCR) coho salmon and LCR steelhead trout are present up to barrier waterfalls on Clear Creek and North Fork Clear Creek just upstream of their confluence (Upper Clear Creek 6th field watershed). UWR and LCR Chinook salmon may be present in the Lower Clear Creek 6th field watershed.

McDowell Creek Project Area

The South Fork of Scott Creek is a moderate-high gradient stream (8-11%) with moderate confinement and a wide range of substrate types, including boulder, bedrock and fines.

LWD loading is high in Scott Creek, although most of the wood is very old and was probably recruited to the stream channel prior to the logging of the old growth trees in the 1930s, 40's and 50's. LWD recruitment potential is generally low due to the age (~50 years**)** and small diameter (<21" avg.) of riparian trees. Streams are generally well shaded by closed canopies provided by coniferous and deciduous trees.

Scott Creek is the only fish-bearing stream within the project area adjacent to any proposed thinning units. Scott Creek supports cutthroat trout throughout its course in Section 21, and at least as far upstream as the crossing of Road 12-1E-15 in Section 25. None of the Scott Creek tributaries in Sections 21 or 25 are fish-bearing, nor are any of the tributaries to Jack Creek in Section 27.

Tributaries to Scott Creek and Jack Creek within the project area are mainly headwater streams with low to moderate confinement and stable, well-vegetated banks. LWD loading levels are adequate, and recruitment potential is adequate since smaller wood functions adequately in small streams. Nine undersized culverts and an existing log fill stream crossing have been identified in this project area.

- **Threatened & Endangered Species:** The McDowell Creek project is located in the Hamilton Creek/South Santiam 5th field watershed. UWR Chinook salmon and UWR steelhead trout are present in the watershed at varying distances downstream of the proposed project units (See *Table 19*). In Hamilton Creek steelhead distribution extends to a barrier falls near the mouth of deer creek, upstream of Scott Creek, the drainage in which most of the project units are located.

  Chinook distribution in Hamilton Creek is suspected to end approximately six miles downstream of the barrier falls near Deer Creek. In McDowell Creek steelhead distribution is suspected to end at the mouth of Fall Creek, approximately four miles downstream of the proposed project units in Section 25. Chinook distribution in McDowell Creek is suspected to end near the mouth of Morgan Creek, approximately two miles further downstream than the distribution of steelhead.

Environmental Effects

3.2.3.1 Proposed Action

The 25 foot minimum stream protection zones (SPZs) on intermittent/ephemeral streams would prevent sediment increases in those channels with dry season logging. New roads proposed for construction would be located in stable locations outside of RR and would not contribute to degradation of aquatic habitat. Reducing the density of trees within the RR is expected to have long-term beneficial effects on aquatic habitat as a result of an anticipated acceleration in growth rate of the trees left in the stands. Accelerated growth of trees within the RR is expected to improve LWD recruitment potential to the aquatic systems.

Roads along the haul routes are generally well established rocked roads and paved roads. Any natural surface roads in the project area would only be used for hauling during the dry season. Sediment effects from hauling on rocked roads would be limited by restricting hauling to periods of dry road conditions, although turbidity at stream crossings may increase slightly in the winter as result of hauling on rocked forest roads.

Proposed culvert replacements would likely result in a short-term (during the first storms following project implementation) increase in stream turbidity as a result of sediment generated during the removal and installation. The increased turbidity from the culvert removals is unlikely to be visible or measurable beyond ¼ mile downstream. The turbidity would have no effect on fish because no fish are suspected to be present closer than ½ mile downstream of the culvert replacement sites. Long-term benefits for aquatic habitat are expected from replacing culverts because it would reduce the potential for future failure. Proposed culvert installations can be found in *(EA section 2.2.2, maps 3 & 4)*.

Threatened and Endangered Species: The projects would have "no effect" on UWR steelhead trout, UWR chinook salmon, LCR coho salmon, LCR Chinook salmon or LCR steelhead trout. Consultation with NOAA Fisheries on the potential effects of the projects on those species would not be required.

The projects would also have no effect on Critical Habitat for the species listed above, or on Essential Fish Habitat (EFH) as designated under the Magnuson-Stevens Fishery Conservation Act. The determinations of "no effect" are based primarily on the location of the projects relative to ESA listed species distributions: all of the proposed harvest units are located well upstream of habitat that may be occupied by ESA listed fish species (*EA section 7.1, Table 19*). Additionally, the projects incorporate design features that would limit increases in water temperature, sediment input to stream channels and associated increases in stream turbidity, and would prevent alteration of streambed and bank characteristics.

Beeline Project Area

No shade producing vegetation within the "primary shade zone" (estimated to be no more than 60 feet from the active stream channel) of perennial streams would be cut or removed.

Canopy closure in the secondary shade zone would be reduced to no less than 50% and therefore, following the BLM/USFS Sufficiency Analysis for Stream Temperature (U.S. Forest Service and Bureau of Land Management, 2004, *Northwest Forest Plan Temperature TMDL Implementation Strategies,* Draft, Portland, Oregon. pp 19), shade loss would be too small to affect stream temperature.

Sediment inputs to streams as a result of falling and yarding would be limited by excluding those activities from the SPZs. Total sediment yields from all sources (i.e., mass wasting, surface erosion, bank erosion, etc.) for small, forested watersheds in the Pacific Northwest range from 0.02-19.43 with a mean of 1.752 t/ac/yr (Patric, 1984). This alternative would likely maintain sediment yield from the treatment unit at the low end of this range and the predicted sediment yield under the worst case scenario in Unit 21B (0.382 t/ac/yr) is well below the average background yields in forested watersheds (1.752 t/ac/yr; from *WEPP*, Elliot et. al., 1997). This is the estimated quantity of sediment delivered to stream channels which is typically a fraction of the total sediment eroded.

Most of the log hauling would occur in the summer. For units that have some cable yarding proposed, with potential winter hauling, increases in road derived sediment would be limited by restricting log hauling to periods of dry road conditions, however, turbidity at stream crossings may increase slightly in the winter as result of hauling on rocked forest roads.

McDowell Creek Project Area

Sediment inputs to streams as a result of falling and yarding would be limited by excluding those activities from the SPZs. Total sediment yields from all sources (i.e., mass wasting, surface erosion, bank erosion, etc.) for small, forested watersheds in the Pacific Northwest range from 0.02-19.43 with a mean of 1.752 t/ac/yr (Patric, 1984). The proposal would likely maintain sediment delivery to Hamilton Creek at the low end of this range: the predicted sediment yield under the "worst case scenario" in Section 21 (0.42 t/ac/yr) is well below the average background yield. This is the estimated quantity of sediment delivered to stream channels which is typically a fraction of the total sediment eroded.

No shade producing vegetation within the "primary shade zone" (estimated to be no more than 60 feet from the active stream channel in all cases) of perennial streams would be cut or removed. Canopy closure in the secondary shade zone would be reduced to no less than 50% and therefore, following the BLM/USFS Sufficiency Analysis for Stream Temperature (U.S. Forest Service and Bureau of Land Management. 2004. *Northwest Forest Plan Temperature TMDL Implementation Strategies*. Draft. Portland, Oregon. pp 19), shade loss would be too small to affect stream temperature.

Most of the log hauling would occur in the summer, but for units that have some skyline yarding proposed, with potential winter hauling, the restriction of log hauling to periods of dry road conditions would limit increases in road derived sediment, however, turbidity at stream crossings may increase slightly in the winter as result of hauling on rocked forest roads.

Section 25: The road proposed for renovation has an existing log fill crossing in Scott Creek. Removal of the log fill crossing would result in a short-term increase in stream turbidity.

Resident fish present approximately ¼ mile downstream would not be affected because the increased turbidity from the log fill removal would not be expected to be visible or measurable more than ¼ mile downstream from the worksite.

Long term benefits for aquatic habitat are expected from removing the log fill and replacing culverts because it would reduce the potential for future failure. Some portions of the roads proposed for renovation are located within RR, and some have stream crossings. Renovation of the roads, and their use for log hauling, are not expected to adversely impact aquatic habitat.

Cumulative Effects

Cumulative effects to fish and fish habitat for both project areas are connected to, and similar to, effects to water quality (stream temperature and sediment). See *EA Section 3.2.2*.

3.2.3.2 No Action Alternative

Under the No Action alternative no change in the existing aquatic habitat conditions would be expected. Canopy closure in primary and secondary shade zones along stream channels would remain at current levels until they are changed by natural processes. Dense stands of riparian trees would be expected to self-thin over time, contributing LWD to stream channels and providing shade to streams at varying levels as overstory densities change through gradual self-thinning and/or large and small scale events such as snow/ice break, windthrow and wildfire. Natural sediment inputs to streams would vary as sediment contributing events occur within the riparian areas. Populations of aquatic species would be expected undergo natural cycles of increase and decline.

Beeline Project Area

No increases in stream sedimentation would occur as a result of culvert removal or replacement. However the undersized culverts would not be replaced, leaving a potential risk of blockage and eventual fill failure which could have severe adverse effects on resident fish and aquatic habitat downstream. Barring failure of the undersized culverts, the No Action Alternative would have no effect on fish or aquatic habitat.

McDowell Creek Project Area

No increases in stream sedimentation would occur as a result of culvert removals or replacements. However, the log-fill crossing on the 12-1E-25.3 Road would not be removed and the proposed culvert installations would not be replaced.

The log-fill crossing and undersized culverts pose a potential risk of blockage and eventual fill failure which could have severe adverse effects on resident fish and aquatic habitat downstream. Barring failure of the log-fill or undersized culverts, the No Action Alternative would have no effect on fish or aquatic habitat.

3.2.4 Soils

Source: *2007 Timber Sale Thinning EA, Soils Report*

Affected Environment

Soils in the project area are primarily loams with varying quantities of gravels or cobbles. Most are moderately well-drained and moderately deep to very deep with some local areas of shallow soils on ridge-tops. Project soils are located on the western low foothills and foot slopes of the Cascade Mountains and are suited for growing Douglas-fir and western hemlock.

Moderate and highly compacted soils have persisted in many of the existing skid trails in the project area that date back to the 1930-50's. A number of undesignated recreational trails on public and private lands were identified during project field work in the Bee Line project area. Many of these trails are heavily compacted and eroded, primarily due to OHV use. The unauthorized trail networks have been developed on surfaces that were originally utilized for forestry operations (i.e. skid roads, old logging trails and fire lines) that were not intended for continual use or for recreational access. This issue is being addressed under the *Cascades Resource Area Soil Rehabilitation Environmental Assessment* #OR080-06-08.

Table 10 - Approximate Slope of Project Areas

Project Area	***Project Acres by Percent Slope****			
	0-35% slope	***35-45% slope***	***45-65% slope***	***>65% slope***
Beeline	320	60	30	1
McDowell Creek	540	30	10	1

** Estimate from slope classification of DEM (Digital Elevation Model) Acres are rounded*.

Environmental Effects

3.2.4.1 Proposed Action

Timber Harvest

Ground-based Yarding: Soil compaction and topsoil displacement from skid trails and landing operations is expected not to exceed ten percent of each project area – consistent with RMP standards and guidelines (p. C-1-2). Limiting tractor operations to periods of low soil moisture when resistance to compaction is higher, using one-end suspension, spacing and location of skid trails, and operating skidding equipment only on slopes less than 35 percent would reduce the relative degree of soil compaction where tractors operate.

Surface erosion and dry ravel resulting from thinning would be minimal because the ground is flat or on gentle (<35%) slopes. The Proposed Action would leave the majority of the surface vegetation, root systems, and litter intact, and limbs from thinned trees would remain on site to further reduce rain impact, surface flow velocity and drying.

Skyline Yarding: On portions of units that would be skyline-yarded, compaction from yarding logs with one end suspension would be relatively light, and generally not exceeding two to four feet wide. Severe erosion and soil rutting in skyline yarding corridors would be prevented by constructing water bars and leaving slash on corridors where appropriate. Skyline landing impacts would be similar to ground-based landings.

Roads

The roads to be constructed would be on relatively gentle topography, and the total width of the clearing would be around 20 feet. New roads would be located and designed so that any resulting runoff would infiltrate rapidly into adjacent undisturbed soils, well away from riparian areas (see design features, *EA Section 2.2.3*, # 2). Placing slash debris on exposed surfaces, constructing water bars, seeding with native species, and blocking vehicle access would decrease surface erosion and runoff. The slash would also provide a source of organic material to the disturbed soil.

Depending on expected future transportation needs, some road beds would be stabilized and left to be utilized in the next harvest cycle. The design features for treating these roads after operations (shaping and/or ripping roadbeds, partially covering with slash, revegetating, and blocking access) would stabilize the soil surface while leaving the subgrade intact for use in future management operations (*EA Section 2.2.3*, # 1, 2). The subgrades would remain as non-forest land. Other roads would be closed (ripped, seeded, and blocked) following harvest. Some recovery to a forested condition would occur in these areas over time.

Encroaching vegetation would be removed and surface rock would be added where needed. Cross drains and stream crossings (culverts) would be added, improved, or replaced to meet current design criteria for 100 year flood events. These improvements would enhance drainage and road surface conditions, decrease road surface erosion into streams, and lower risk of culvert or fill failure. See *EA section 2.2.1, # 1* for proposed road work.

Pile Burning:

On the sites where piles are burned, surface organic material would be removed and the soil exposed to potential erosion until revegetated. However, such localized erosion is highly unlikely to deliver sediment to streams, since burn-pile areas are outside of the Riparian Reserve LUA, widely dispersed, and typically smaller than 20 feet in diameter surrounded by vegetated area. Pile burning and rain impact on burned spots can decrease infiltration capacity until natural re-vegetation occurs. Displaced soil would be filtered and retained by the intact vegetation immediately surrounding the burn-pile spot. Since burning would occur during wet soil conditions, heat damage to the upper soil layer would be moderated and only occur in scattered localized sites. See *EA Section 3.2.6* for additional information on pile burning.

Cumulative Effects

Because the effects of the proposed action on soils are expected to be short-term (maximum one decade) 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.

3.2.4.2 No Action Alternative

Existing, maintained rocked roads would continue to be part of the transportation system and be maintained according to the Salem District transportation management plan, and would remain as non-forest land and provide access for management activities and public use. Historic unmaintained landings would be left in their current condition, which range from virtually no evidence of recovery to advanced recovery where understory vegetation is similar to adjacent areas. Vegetation and other natural processes would continue to slowly break up compaction and continue the process of recovering productive capability over time.

3.2.5 Wildlife

Source: *2007 Timber Sale Thinning EA - Wildlife Report*

Affected Environment

Variation in forest stand conditions within stands and at the landscape level have been identified as a key factor in providing habitat for a diversity of forest organisms. Some of the things that have been found to be important contributors to habitat diversity and species richness include; dead wood in the form of snags and down logs, remnant live trees (trees that are older and larger than most of the trees in the stand), and vertical and horizontal variation in tree and understory canopies. Hardwood trees and shrubs in particular have been found to be important contributors to forest biodiversity, providing important elements of habitat such as shelter, cover, food sources, foraging area, and other habitat conditions.

All of these features are generally lacking in the managed stands proposed for thinning.

Residual Old-Growth Trees, Coarse Woody Debris (CWD), and Special Habitats:

Table 20 shows a summary of special habitats, remnant old growth and CWD by project area.

Residual Old-Growth Trees: There are a few, scattered remnant old growth trees in the McDowell Creek units in Section 25, T. 12 S., R. 1 E., generally in the south half of the section (25C&D). None have been found in any other units of either McDowell Creek or Beeline project areas.

CWD:

Large Logs, Decay Classes 1 and 2: CWD that would meet RMP management direction (240+ linear feet per acre of material in decay classes 1 or 2, at least 20 inches in diameter at the large end, and 20 feet in length) is currently lacking (0-90 linear feet per acre) in all of the units proposed for thinning (RMP, p. 21).

Large Logs, Decay Classes 3-5: Large CWD in more advanced decay conditions (decay class 3, 4 & 5) is present in all of the units, ranging from 180 – 500+ linear feet/acre and are usually remnants of the cull logs described earlier.

Small Logs: The less decayed logs in smaller size classes found in these units (generally 6 - 14 inches diameter) are mostly the result of recent self-thinning in crowded, overstocked stands. These small logs are much less useful to forest floor-associated animal species for cover, and usually last less than two decades

Special Habitats: There are no special habitats present in or adjacent to any of the units. Special habitats include wet and dry meadows, talus, cliffs and rock outcrops.

Snags and Snag-Associated and Cavity Nesting Species:

Stands throughout the project areas generally have a near-term (less than three decades) snag deficit (RMP, p. 21), with very few useable snags that are at least 15 inches diameter and 15 feet tall. Snag habitat does not meet the 40 percent of maximum population densities requirement for the five woodpecker species (RMP, p.21; as referred to in Neitro *et al* (1985)). Most of the snags that are present are small (less than 20" dbh) and/or highly decayed. Trees that could have developed into large snags and down logs were removed by past timber management treatments and relatively few trees have grown large enough to create suitable snags at this time (*Table 21*).

The hairy woodpecker, red-breasted sapsucker and pileated woodpecker are species associated with conifer stands in the western Cascade Mountains, and are most likely to be affected by thinning young stands. Northern Flicker and Downy woodpecker are not typically associated with closed-canopy conifer-dominated stands in the western Cascades, though both species may be found in or around the project areas.

Threatened and Endangered Species

*Northern Spotted Owl***:**

Beeline: The proposed thinning units provide 410 acres of dispersal habitat. The closest known spotted owl sites are located 3 to 4 miles to the south and east. Spotted owl responses in this area have been rare in the past, indicating that use and occupancy in these scattered blocks of lower site, higher elevation stands is infrequent. There are no spotted owl core areas in the vicinity of the proposed units.

McDowell Creek: The proposed thinning units provide 580 acres of dispersal habitat. The closest known spotted owl site is located within 0.5 to 1 mile of the proposed units in section 21. The site was last occupied in 2002. There are no spotted owl core areas in the vicinity of the proposed units.

BLM Special Status Species:

BLM Wildlife Biologists assessed the potential presence of BLM Special Status Species (Sensitive and Assessment categories) in the Cascades Resource Area (*Wildlife Report*, Table 6). Listed species that are either confirmed or potentially expected to occur in the project areas are documented below. Vegetation surveys (stand exam data) indicate that most of the stands proposed for thinning are lacking in habitat elements that support diverse populations of wildlife species, especially CWD, snags (with loose or detached bark), deciduous understory and ground cover vegetation, or deep accumulation of leaf litter. Habitat and range data and previous surveys for mollusks and amphibians conducted over 9000 acres on the Cascades Resource Area since 1991 indicate that no mollusk Bureau Sensitive and/or Survey and Manage mollusk species are likely to be present in the proposed thinning units.

Bureau Sensitive – Oregon Slender Salamander

Oregon slender salamander, a Bureau Sensitive Species, is expected to occur in portions of the project areas where CWD of adequate size (generally >16" diameter at the large end) occurs. Oregon slender salamander has been found throughout the Cascades Resource Area in stands across the full range of seral stages. Its distribution on BLM land within the planning area appears to be limited by dry conditions at low elevations along the Willamette Valley floor, and by cold conditions at higher elevations (Dowlan, unpublished 2006).

Habitat is generally described as conifer-forested stands dominated by Douglas-fir with large amounts of large rotten (decay class 3 to 5) Douglas-fir down logs. Old logs, stumps and large woody material piles around stumps, and exfoliated tree bark on the ground are used for cover, feeding and breeding. Larger material that can hold moisture through summer drought is generally considered to be most important in maintaining moderate subsurface microclimate conditions. Optimal habitat for these animals is generally described as late-successional forest conditions with cool, moist microclimates and large down wood.

The species has been found in Section 17 of the Beeline project area, and Section 21 of the McDowell Creek project area. It is likely to be found in other sections of the project areas where there is a relative abundance of CWD in the advanced stages of decay.

Bureau Assessment – Cascade Torrent Salamander

Species in the genus *Rhyacotriton* are nearly always found in cold, clear streams, seepages, or waterfalls from sea level up to about 1,200 m in elevation. They are frequently found in intermittent streams and seeps, usually under woody debris, under rocks, or buried in very loose uncompacted gravel. Cascades torrent salamander has been found throughout the Cascades Resource Area and is suspected to occur in the project areas.

Bureau Sensitive - Northern Goshawk

The proposed thinning units provide marginal habitat for Northern Goshawks. The goshawk prefers older forests with dense canopy closures at higher elevations, while the proposed units are mid seral stands. McDowell Creek is located at lower elevations while the Beeline project area is generally higher elevation. No goshawks are known to be present in the project areas.

Survey and Manage Category B – Red Tree Vole
Red tree vole is associated with conifer forests west of the Cascades summit. The project areas are within the "Northern Mesic Zone" of the range identified for the species. Though the project areas are within the Northern mesic zone of the red tree vole range, none of the stands that would be thinned meet the stand-level criteria as described by Biswell, *et al* (2002). In addition, the project areas fall under an exemption issued in the October 11, 2006, modified injunction in Northwest Ecosystem Alliance *et al.* v. Rey *et al.*, which makes an exemption for thinning projects in stands under 80 years of age.

Bats: Three former Protection Buffer bat species occur in the Cascades Resource Area (silver-haired bat, long-eared myotis, and long-legged myotis). These species are associated with caves and mines, bridges, buildings, cliff habitat, or decadent live trees and snags with sloughing bark.

Large snags and standing dead trees with bark attached are used variously as solitary roosts, maternity roosts, and hibernacula by these species, and six other bat species associated with Douglas-fir forests (Christy and West 1993). Since this habitat is very rare in the project areas, presence of these three species is unlikely. Other Special Status bat species are more closely associated caves, rock outcrops, buildings and abandoned mines, habitat features not present in the project area.

Migratory and Resident Bird Species:
Bird species richness at the stand level has been correlated in some recent studies with habitat patchiness, densities of snags, and density by size-class of conifers (Hagar, McComb, and Emmingham 1996, Hansen et al. 2003). Even-aged conifer stands provide habitat for a relatively high abundance of a few bird species (hermit warbler, red-breasted nuthatch, and golden-crowned kinglet, for example) which feed on insects gleaned from conifer foliage, however, these species are generally common in conifer stands of all ages.

The proposed thinnings are located in the Western Oregon Cascades Physiographic region. The Partners in Flight conservation plan which addresses the Western Oregon Cascades is the *Conservation Strategy for Landbirds in Coniferous Forest of Western Oregon and Washington* (1999). None of the proposed thinnings are located in a high priority forest type and the Western Oregon Cascades is not identified as a high priority physiographic region.

The structurally simple, even-aged, single-layered, closed-canopy stands with poor understory development that characterize the project areas are relatively low in landbird species composition and richness. Focal species for this forest condition include the Hutton's vireo and black-throated gray warbler. The habitat attributes that these species associate with are deciduous canopy/subcanopy layers. The light-limited understory of unthinned stands does not provide for a diverse community of shrub and ground cover plant species that are important in providing insect and plant food resources for bird species which rely on living deciduous trees, shrubs, and leaf litter (Hagar 2004). Abundance of arthropod prey species has been correlated with understory and midstory vegetation, particularly tall shrubs and hardwoods. These habitat elements are lacking or poorly-developed in most of the stands proposed for thinning.

The winter wren is associated with forest floor complexity, including slash and CWD, which is found only occasionally in the project areas.

Studies conducted in western Oregon have helped to define a typical avian community that is most closely associated with the simple structure of the stands in the project areas. The most common species include: hermit warbler, golden-crowned kinglet, winter wren, red-breasted nuthatch, and Swainson's thrush, all of which are also common (or more abundant) in stands with greater structural complexity. Based on current habitat conditions, no migratory or resident bird species with BLM special status are expected to occur in the project areas.

Big Game: Big game species that are found in the project areas include Roosevelt elk (*Cervus elaphus roosevelti*) and black-tailed deer (*Odocoileus hemionus*). The project areas are in mid seral stands which provide hiding and low quality thermal cover. Early seral communities and mid seral stands are abundant on adjacent private lands surrounding the project areas.

The Salem District Record of Decision and Resource Management Plan (RMP) approved May 1995, identifies no critical winter or summer range in the project areas (RMP p.26).

Environmental Effects

3.2.5.1 Proposed Action

Research that has occurred since the 1980s has determined that it is possible to develop desired structural and compositional diversity in young managed stands through specific actions. Thinning forest stands produces what has been described as "cascading ecological effects" (Hayes, Weikel and Huso, 2003) that result from reduced competition between overstory trees and increased availability of solar radiation to the forest floor. Growth, size, branch diameter, and crown ratio of the remaining trees is increased, and development of understory vegetation is stimulated. These changes effectively increase structural complexity and alter habitat quality and availability for a range of invertebrate and vertebrate species. These changes are considered to be beneficial since there is an abundance of simplified structure habitats in the vicinities of the project areas.

In the Riparian Reserve (RR), greater variability in thinning densities (compared to adjacent Matrix stands) would add a greater degree horizontal complexity to these stands and acquire desired vegetation characteristics needed to attain ACS objectives (RMP, p. 11).

Residual Old Growth Trees, Snags and Coarse Woody Debris (CWD)

No residual old growth trees would be damaged by logging activities or silvicultural practices. All dead wood that is on-site when timber marking takes place would remain on-site, either in the form of standing snags or as down logs, after thinning. Design features would protect most existing snags 15 inches diameter and larger in all decay classes to effectively reserve the best existing habitat features for primary excavators (woodpeckers), and secondary cavity users, such as songbirds, and small mammals.

Some snags of this size class would be felled for safety reasons, or fall incidental to thinning operations, with smaller diameter and taller, leaning snags the most likely to be felled or knocked over. Any snag that falls for any reason as a result of thinning operations would remain on-site as CWD, providing important habitat for a different, but also key, group of dead-wood associated species.

Most units throughout the project areas are expected to remain in a snag deficit condition (RMP, p. 21) for one to four decades, until live trees become large enough (at least 20" dbh) to provide for recruitment of large snags and CWD which would meet RMP requirements. As a result of thinning, growth of residual live trees would be accelerated, so that larger trees would be available sooner than without thinning to contribute additional large snags and CWD in the future stand. The RMP guidelines (RMP p. 21) for snags (40 percent maximum population densities) and CWD (240+ linear feet per acre of material in decay classes 1 or 2, at least 20" in diameter at the large end, and 20 feet in length), could be met in one to four decades. Large diameter CWD in more advanced decay conditions would remain and contribute to forest floor wildlife habitat conditions for many decades before passing through decay class five to become unrecognizable as down logs.

It is anticipated that less than ten percent of existing CWD would be directly impacted by logging. Less than ten percent of the thinning area would be directly impacted by skidding, which is the operation with the highest potential impact to existing CWD. BLM oversight of skid trail locations would ensure that skid trails were located to avoid impact to high value CWD whenever feasible, reducing the anticipated impacts below the ten percent level that would be expected from locating skid trails without concern for CWD. The same principles generally apply to snag protection. Observations of the project areas indicate that most of the snags larger than 15 inches diameter are not hazardous.

For Riparian Reserves (RR), silvicultural treatments are recommended to acquire desired vegetation characteristics needed to attain ACS objectives (RMP, p. 11). The Proposed Action and associated design features for RR would contribute to accomplishing these management directions by promoting higher diameter growth rates to become large trees faster, and providing a renewable supply of snags and large CWD.

Federally Listed Species: Northern Spotted Owl:

No known spotted owls would be affected by thinning or connected actions. In the short-term, disturbance associated with thinning (logging, road-building, etc,) may have temporary effects on the presence or movement of spotted owls. However, since thinning would maintain dispersal habitat, the ability of the habitat to accommodate movement of birds after thinning is completed would be maintained. Seasonal restrictions on habitat modification activities (felling, yarding, and road building) would minimize the risk of disturbance to any unknown northern spotted owls during the critical nesting season.

In the short term, approximately 1000 acres of dispersal habitat would be degraded as a result of thinning, but no habitat would be downgraded to a lower classification. "Degrade" habitat means to affect the quality of spotted owl dispersal or suitable habitat without altering the functionality of (or downgrading) such habitat.

Thinning treatments in these dense, uniform stands are expected to have long-term benefits to spotted owls by encouraging late-successional characteristics to develop at least ten years more rapidly than they would be expected to develop without treatment. In 10 to 40 years these stands could develop foraging and nesting structure and be upgraded to suitable habitat. Residual trees would increase in size and be available for recruitment or creation of snags, culls and CWD for prey species and nesting opportunities for spotted owls.

Beeline

In the short term, 410 acres of dispersal habitat in the Lower Clackamas and Molalla River Watersheds would be degraded as a result of thinning. These stands would be maintained as dispersal habitat after harvest. In the long term, canopy closures would increase and other structural elements would develop so that these stands would attain suitable habitat conditions within 20 to 40 years.

McDowell Creek

In the short term, 580 acres of dispersal habitat in the Hamilton Creek Watershed would be degraded as a result of thinning. These stands would be maintained as dispersal habitat after harvest.

In the long term, canopy closures would increase and other structural elements would develop so that these stands would attain suitable habitat conditions within 10 to 40 years.

Special Status and Survey and Manage Species

Bureau Sensitive – Oregon Slender Salamander

Oregon slender salamanders would be expected to persist at sites within stands where CWD of adequate size and distribution currently occurs, although some mortality to individuals could result from crushing or loss of wood/soil contact. Design features limit skid trails that could impact CWD to less than ten percent of the project area and provide for protection of CWD as feasible, so at least 90 percent of the CWD currently on-site prior to thinning is expected to last for many decades continue to provide refuge for terrestrial salamanders after treatment.

Second-year post-treatment surveys in the Keel Mountain Density Management Study Area (one of the ongoing research projects on BLM land in the Cascades Resource Area) indicate that Oregon slender salamander was not affected by thinning (Rundio and Olson 2006 in review). These results are consistent with survey results elsewhere in Cascades Resource Area from stands that had been subjected to timber harvest in the past (Dowlan, unpublished 2006).

Bureau Assessment – Cascade Torrent Salamander

No adverse effects to Cascades torrent salamander are expected as a result of thinning. Post-treatment studies at twelve western Oregon density management sites included in research on the initial effects of headwater Riparian Reserves with upslope thinning on stream habitats and amphibians (Olson, 2006 in review) found no evidence of adverse effects from thinning to torrent salamander species present in the project areas (with all thinning densities and riparian reserve widths).

Bureau Sensitive – Northern Goshawk
No Northern goshawks are known to be present in the project areas, so none are likely to be affected by thinning. Marginal goshawk habitat in the proposed units would be temporarily altered due to reduction of canopy closures below current levels. This habitat would become higher quality habitat as structural complexity of stands increases and larger trees become available for nest platforms.

Survey and Manage Category B – Red Tree Vole
No known red tree voles would be affected by the proposed projects. Habitat conditions for red tree voles would become more suitable after thinning as the stands continue to mature and develop older forest characteristics sooner than they would without thinning. In the short-term, it is possible that undetected nests within marginal habitat could be disturbed during thinning.

Migratory and Resident Birds
Changes in habitat structure are expected to have an immediate effect on bird communities in thinned stands. Thinning densely-stocked conifer stands would be expected to immediately enhance habitat suitability for species which prefer a less dense conifer canopy, and reduce habitat suitability for species that prefer continuous conifer canopies. Individuals of some species may be displaced from thinned areas, but would find refugia in nearby unthinned patches, and return as stands respond to thinning and the canopy closes. No species would be extirpated and no migratory or resident bird species with BLM special status would be impacted in these stands as a result of thinning.

Overall bird species richness (a combination of species diversity and abundance) would be expected to gradually increase for up to 20 years (prior to the closing of the canopy again) as hardwood components of stand structure develop, plant species composition becomes more complex, and hardwood shrub layers, epiphyte cover, and snag density become more prominent within the stands.

Big Game
Big game species would be temporarily disturbed by the proposed action. Logging equipment noise and human presence may cause animals to avoid or disperse from the project areas temporarily. Thermal and hiding cover would be maintained after harvest, though its quality would decrease in the short-term (0 to10 years) as a result of thinning, opening roads, renovating roads and road improvements (Cole, et al. 1997, Trombulak and Frissell 1999, USDA (PNW) 2006). Vegetative forage such as saplings, shrubs, grasses and forbs would increase as a result of openings created by thinning and road closures after thinning. As a result of increased light, forage quantity would increase and attract early successional species to the areas such as elk and deer.

In the long term (10+ years), thermal and hiding cover quality would improve and vegetative forage such as saplings, shrubs, grasses and forbs would decrease as a result of canopy closure decreasing the amount of light reaching the forest floor.

Cumulative Effects

Residual Old Growth Trees, Snags and CWD: Regardless of the scale for assessing cumulative effects, design features would protect existing CWD, residual old growth trees, and snags 15+ inches dbh. Existing old-growth remnants, snag and CWD habitat elements would be largely retained through thinning, with a minor degree of loss as a result of falling and yarding operations. Some snags, especially smaller diameter/taller snags, would be felled for safety reasons, or fall incidental to thinning operations. Any snag that falls for any reason as a result of thinning operations would remain on-site to become CWD, providing important habitat for a different, but also, key group of dead-wood associated species.

Beneficial cumulative effects to CWD and snag habitat and associated species would be expected to occur as a result of implementing the projects, since larger trees would be available to contribute additional large snags and CWD in future stands sooner than they would develop without thinning

Northern Spotted Owl: The proposed action alternative would not contribute to cumulative effects to northern spotted owls because the proposed action maintains dispersal habitat within and between known owl sites, and does not downgrade any suitable habitat within known owl sites.

The scale for cumulative effects for the northern spotted owl is the provincial home range of any known spotted owl site (known owl site). The scale was chosen because a goal for conservation and recovery for spotted owl would be to maintain suitable owl habitat within the provincial home range of known owl sites, and maintain dispersal habitat between LSRs and known owl sites.

BLM Special Status and Survey and Manage Species: The proposed action alternative would not contribute to cumulative effects to the Oregon slender salamander and other CWD associated species. Suitable habitat conditions would be maintained in the short term in the project areas, providing refugia for low-mobility amphibians and invertebrates. In the long term, larger trees would be available sooner than without thinning to contribute additional large CWD in future stands. Implementation of the proposed action would not eliminate connectivity between project units or adjacent untreated stands under BLM management.

No adverse cumulative effect to red tree vole habitat is expected because:

- No suitable habitat (as described in the Management Recommendations for the Red Tree Vole, Version 2.0 p. 7) would be lost or altered;
- The thinned stands would attain older forest conditions sooner as a result of the density management thinning project.
- Undisturbed habitat in the same or similar age class with connectivity to the thinning units exists within the project area, and elsewhere within the affected section.

Thinning in the project areas, either individually or collectively, would not be expected to contribute to the need to list any Bureau Sensitive species under the Endangered Species Act (IM OR-91-57, Oregon-Washington Special Status Species Policy) because habitat for the species that is known to occur in the project areas would be not be eliminated, habitat connectivity would not be changed, any habitat alteration would have only short-term negative effects, and long-term effects would be beneficial.

Migratory and Resident Birds: Habitat changes resulting from the proposed action would not eliminate any forest cover or change habitat patch size. Therefore, thinning would not contribute to a fundamental change in the species composition of existing bird communities within the watershed. Therefore, no adverse cumulative effects would occur to migratory birds.

Big Game: No adverse cumulative effects to big game species populations are expected. The proposed action would not fundamentally change or eliminate any forest cover or change any habitat patch size. Therefore, thermal and hiding cover present before treatment would be maintained after harvest.

3.2.5.2 No Action Alternative

Habitat Structure and Diversity, and Residual Old Growth Trees, Snags and Coarse Woody Debris:

Overcrowded stands with low vigor and small crowns would grow more slowly compared to thinned stands. Self thinning would occur, but diameter growth would not accelerate as fast as in thinned stands. Snags and CWD created by self thinning mortality would not be large enough to meet RMP standards until later in the life of the stand (approximately 20 to 50 years) when suppressed co-dominates achieve these diameters before dying. Without management intervention, stands would take longer to develop late successional habitat conditions and remain less diverse for a longer period of time.

Federally Listed Species: Northern Spotted Owl

There would be no immediate change in spotted owl habitat classification and no effect to spotted owls caused by management action. Habitat conditions would remain as described in the Affected Environment, and would continue to develop slowly over time for reasons stated above. In unthinned areas, it would take approximately 20 to 50 years to develop suitable habitat conditions if left untreated.

Survey and Manage and BLM Special Status Species:

In the short term, there would be no immediate change in current habitat conditions for Survey and Manage and BLM Special Status Species. In the long term (20 to 50 years):

- Development of Oregon slender salamander habitat conditions would likely be delayed (compared to the proposed action) without the addition of new large woody material to replace existing well-decayed material that would eventually disappear.
- The development of goshawk habitat would take longer because structural complexity of stands and larger trees would take longer to develop.

- Since no new disturbance to the conifer canopy would occur, no undetected red Tree Vole nests would be affected. Optimal red tree vole habitat conditions, presumed to be older forest conditions, would develop more slowly without thinning.

Migratory and Resident Birds:

Habitat conditions would remain as described in the Affected Environment, and would continue to develop slowly over time. Species richness of bird communities would reflect the simple single storied mid seral stages for a longer period of time, and overall bird species richness would be less. Bird species richness in the Matrix LUA that may be subject to regeneration harvest may not noticeably increase prior to harvest, and legacy features in the future stand would likely be smaller and less long-lasting, especially those that provide habitat for cavity-nesting species.

Big Game:

In the short term (0 to 10 years), there would be no disturbance effects due to the proposed action. Thermal and hiding cover quality would remain the same. There would be no increase in vegetative forage due to increased light to the forest floor. In the long term (10+ years), thermal and hiding cover quality would gradually decrease as overstocked stands mature hindering mobility. Forage quantity would decrease over time as less light reaches the forest floor.

3.2.6 Air Quality and Fire Hazard/Risk

Source: *2007 Timber Sale Thinning EA - Fuels Management /Fire Ecology Fuels and Air Quality Report (Fuels Report)*

Affected Environment

The proposed thinning projects range from stands located along open roads and within Wildland Urban Interface (WUI) to areas behind locked gates.

Beeline Project Area: None of the acres within the project area are within the WUI, but there are roads open to public access and fire control through most of the 410 acres proposed for thinning treatments. Existing fuel loading for this project area varies between 20 and 45 tons/ac. There is a large component of 1000 hour fuels left from past logging. Relative density for the stands average 70, which is correlated with a canopy bulk density high enough to sustain a crown fire (Agee, 1996; and the Van Wagner model).

McDowell Creek Project Area: Of the 580 acres proposed for treatment, only the units in section 21 are within the WUI boundary and/or along open roads. Most of the McDowell Creek area is closed to access by the general public through Weyerhaeuser and other Industrial Forestry gates or poor road conditions, but these roads do provide access for fire control. Existing fuel loading for this project area varies between 15 to 30 tons/acre. Relative density for the stands average 65, which is correlated with a canopy bulk density high enough to sustain a crown fire in many of these stands.

Air Quality: Prevailing winter winds are from the west and would carry any smoke from the project areas away from the Willamette Valley. Redmond and Bend are the down-wind communities potentially affected the most in our prescribed burning program. These communities are located approximately 50 miles to the east, that smoke from the project poses very little if any threat to their air quality.

Fire Hazard/Risk: The most common source of fire starts in the Cascades Resource Area is lightning, followed by human caused fires. In the WUI and along roads open to public access, the potential for a human caused start are highest, along with the potential costs. The proposed thinning projects range from stands located along open roads and within WUI to areas behind locked gates. The current strategy to reduce the risk of a human ignition is to reduce fuels in accessible areas and/or decrease access during periods of high risk. The current strategy to reduce the risk of a fire start (both natural and human caused) from becoming a large fire is aggressive initial attack through a contract with the Oregon Department of Forestry and their fire protection crews. Existing forest roads in these areas provide access for fire control.

The forest stands in the proposed project areas have not experienced fires for many decades. In the Beeline project area, this is approaching the fire return interval for the fire regime in the area. In the McDowell Creek project area the natural fire return interval has already been exceeded. The combination of existing dead fuels and stand conditions (especially crown density) in these stands could sustain surface and crown fires. In 2006, large (>700 acres) lightning caused fires occurred within 10 miles of both project areas and smaller fires started by lightning and people were controlled by initial attack.

Table 11 - Modeling Predictions of Fire Regimes for the Project Areas

Project Name	***Fire Return Interval***	***Severity***
Beeline	50-100 years	Mixed
	100-200 years	Mixed
McDowell Creek	0-35 years	Low
	>50 years	Mixed

Environmental Effects

3.2.6.1 Proposed Action

Air Quality:

Smoke produced from burning should have little impact on people. Burning after the fall rains begin usually results in rain scrubbing smoke particles out of the air before the smoke travels off site in the air-shed. Smoke produced should be low in quantity because of the small number of piles to be burned and because the covered wood would be dry.

Fire Hazard/Risk

Thinning would reduce the canopy bulk density (CBD) to levels that would be unlikely to sustain a high intensity crown fire.

Fuel treatments in areas with elevated risk of human caused ignition would reduce potential starts. Fuel treatments adjacent to areas with high value (BLM resources such as riparian habitat, and private lands) would reduce potential costs associated with fire control and fire damage. Maintaining roads would provide access for rapid and effective initial attack of any fire starts that do occur. Access control with gates or road blocks which are easily removed with initial attack dozers would provide for initial attack access while reducing potential for human caused fire starts.

Wildfire effects may include: 1) total tree mortality, 2) elimination of the duff and litter layers, 3) reduction of the downed woody component, especially logs in later stages of decay, 4) increased erosion and sedimentation of water courses, and 5) formation of snags. All thinning projects result in short term (1-3 year) increased fire ignition potential because of the increased fine dead fuel.

The increased fuel loadings within the stand after thinning would increase the risk of a fire start and if one started that it would be a higher intensity fire. This risk would be greatest during the first year "red needle stage". Risk would decline within three years following harvest as needles and twigs (fine fuels) detach and break down. Initiation and growth of under story vegetation would combine with break down of the slash and provide green fuels that would not burn as easily except under dry conditions. A return to pre-harvest fuel levels occurs after a decade or two.

Thinning from below removes ladder fuels (fuels that provide a "ladder" for fire to climb from the surface into the crowns) and decreases tree crown density (or crown bulk density). This translates, in Agee's studies (1996) to a relative density of 35-45 as the level where crown bulk density cannot sustain a crown fire.

Thinning is followed by a reduction in the surface fuel load, either by fuel treatment or natural processes. Machine fuel treatment (also called mastication, mulching or chopping) changes the size and distribution of the fuels which reduces the intensity of a fire and ignition potential. Piling and burning small diameter slash removes activity fuels. Natural decay and understory vegetation growth reduce the ability of surface fuels to carry fire. This two step approach reduces tree canopy, ladder fuels and surface fuels, thereby reducing both the intensity and severity of potential wildfires (Graham, *et al*, 2004). Reducing fuel loads also results in more efficient and quicker fire suppression, less risk for fire fighters and less resource damage.

Thinning in Beeline would reduce the relative density to 45-55, a level where it is unlikely that a crown fire could be sustained. Initial treatment of 20 percent of the total area along open roads would reduce the risk of a human caused fire starting near a road.

Thinning in McDowell Creek would reduce the relative density to 35-40, a level where it is unlikely that a crown fire could be sustained. Fuel treatment would be done on approximately 6 percent of the treatment area, the portion that is within WUI and near roads, to reduce the risk of human caused fire.
Total fuel load for these project stands following thinning increases by 20 to 30 tons/acre with 50 to 75 percent of that increase being less than 3 inches in diameter (fine fuels), depending upon purchaser utilization.

Cumulative Effects

Current trends in human activity and related potential for fire starts would be expected to remain the same or increase as population and WUI increases. The cumulative potential for wildfire start and growth would increase in the short term (1-3 years) and decrease in the longer term (1-2 decades) as a result of the proposed action.

Because it has been 100 years since a large fire occurred in the project areas, the potential risk for a fire is greater today. There are also predictions that climate change would result in more frequent and larger fires (Westerling etal 2006, Swetland 2006, Whitlock etal 2003). In 2006 two larger fires (700 ac. +) occurred within the vicinity of the project areas.

Near Beeline the Blister Fire, (10 miles SE on the Mt. Hood NF) started by a lightning strike and burned ~800 acres. Near McDowell the Middle Fork Fire (9 miles E on BLM and Private) started near a logging site from a lightning strike and burned over 1000 acres. At least 7 other smaller fires were started from this same storm but were controlled. Although the primary sources of fire ignitions are lightning and humans, we have no control over lightning; however treatment and access control can reduce the potential for human caused fires and reduce fire intensities.

3.2.6.2 No Action Alternative

Under the no action alternative, there would be no effect on air quality from burning, although intense wildfires would produce a large quantity of smoke in a short period of time if they were to occur. Since wildfires often occur under east wind conditions, the Willamette Valley would be in the path of this smoke.

Severity and the potential for a crown fire would be higher for dense stands with accumulating surface fuels in the long term (one to several decades). The potential risk can change annually with weather conditions and possibly increase in the longer term if predicted climate change takes place.

3.2.7 Recreation, Visual Resources and Rural Interface

Source: *2007 Timber Sale Thinning EA – Recreation, Visual and Rural Interface Resources Report*

Affected Environment

Recreation: The two proposed project areas are characterized by a forest setting and are accessed by paved or gravel forest roads. Evidence of man-made modifications such as roads and timber harvest are common on both private and public land within the general area. Activities occurring in the general area include hunting, target shooting, hiking, and horseback riding. Within the Beeline project area an extensive network of unauthorized, user-created off highway vehicle (OHV) trails can be found within several of the unit boundaries and throughout the surrounding area. Recreational use of the McDowell Creek project area is relatively low due to locked gates and a general lack of off-road trails.

Visual Resources: Both proposed project areas are characterized under the VRM Class 4 designation. VRM class 4 allows for major modifications of the existing character of the landscape.

Table 12 - Acres in Each VRM Class by Project Area

Project Name	*VRM Class 2 (Acres)*	*VRM Class 3 (Acres)*	*VRM Class 4 (Acres)*
Beeline	0	0	410
McDowell Creek	0	0	580
Total	0	0	990

Rural Interface Areas (RIAs): None of the proposed units are in a Rural Interface Area according to the Salem District Resource Management Plan (RMP p. 39).

Environmental Effects

3.2.7.1 Proposed Action

Recreation and Visual Resources: Recreational use within the proposed units would be restricted in the short term during the thinning operation. A forest setting would still be maintained, and vegetation disturbed by logging activities would be expected to return within five years. The thinning of the proposed units would open up the stand, which may make it easier to walk or ride horses through the units.

Unauthorized, user-created OHV trails would be impacted as part of the proposed project, reducing the number of these trails available for this use. Entrances to existing OHV trails within unit boundaries would be blocked, as would skid trails and other potential entry points resulting from the proposed action. Large amounts of logging slash and debris would deter OHV users from re-opening existing trails or creating new ones.

There may be some disturbance to nearby residences associated with logging and hauling activities (weeks), but this is a common, ongoing activity in these areas. There would also be some short-term (days) decline in visual quality as a result of the smoke created by burning debris piles in the winter. The piles would be burned in compliance with Oregon smoke management regulations.

There would be week-day disturbance to McDowell Creek Park associated with hauling, but this is a common, ongoing activity in this area. This would not occur on weekends and holidays when use levels are higher.

Rural Interface Areas (RIA's): None of the proposed units are in a Rural Interface Area so there would be no environmental effects in the proposed project area.

Cumulative Effects
The proposed action would not have a measurable impact on visual resources, recreation or rural interface. All activities are common and ongoing in the affected areas. Hence, the proposed action would have no cumulative effects.

3.2.7.2 No Action Alternative

There would be no change to current use patterns. Logging and hauling would continue to be frequent activities since much of the surrounding land is private industrial forest land and, near Beeline, US Forest Service land, where timber management is a common practice. Unauthorized OHV use would continue, and more unauthorized OHV trails would probably be created. Dispersed recreation patterns would continue.

3.3 Compliance with Components of the Aquatic Conservation Strategy

Table 13 shows compliance with the four components of the Aquatic Conservation Strategy for all Action alternatives (1/ Riparian Reserves, 2/ Key Watersheds, 3/ Watershed Analysis and 4/ Watershed Restoration). This table applies to both project areas.

Table 13 - Compliance with Components of the Aquatic Conservation Strategy

ACS Component	***Project Consistency***
Component 1 - Riparian Reserves	Maintaining canopy cover along all streams and the wetlands would protect stream bank stability and water temperature. For project units in all watersheds, Riparian Reserve boundaries would be established consistent with direction from the *Salem District Resource Management Plan* (p. 10). Road and landing locations have been minimized in Riparian Reserves.
Component 2 - Key Watershed	There are no key watersheds in the proposed project area. No new permanent roads are proposed within the project area. Riparian Reserve management direction has been incorporated in the design of thinning units in the project area (RMP p. 7).
Component 3 - Watershed Analysis	Beeline: *Molalla River Watershed Analysis*, [May, 1999], *Upper Clear Creek Watershed* Analysis, [September, 1995], *Lower Molalla River and Milk Creek Watershed Assessment* [October 2004] McDowell Creek: *Hamilton Creek Watershed Analysis*, [March, 1995]
Component 4 - Watershed Restoration	Thinning in all LUAs in both project areas would be expected to result in long-term restoration of large conifers and the potential for material that would contribute to in-stream habitat complexity in the long-term. Variable density thinning in Riparian Reserves would further enhance terrestrial habitat complexity in the long and short term.

3.4 Comparison of Alternatives with regard to Purpose and Need

Table 14 - Comparison of Alternative by Purpose and Need

Purpose and Need (Section 1.2)	***No Action***	***Proposed Action***
Maintain the health and growth of developing stands.	**Does not fulfill.** Stand health and tree growth rates would decline if stands are not thinned. Competition would result in mortality of smaller trees and some co-dominant trees in the stands.	**Fulfills.** Stand health and tree growth rates would be maintained as trees are released from competition.
Achieve a desirable balance between wood volume production, quality of wood, and timber value at harvest (RMP p. D-3).	**Partially fulfills.** Partially meets wood volume production over course of rotation. Logs at end of rotation would be smaller diameter which generally reduces value compared to thinned stands.	**Fulfills.** Maintains volume production throughout the rotation (management cycle) of the stand. Lengthens the rotation so that logs at end of rotation would be larger diameter.
Provide a sustainable supply of timber as described in the RMP (p. 1, 46, 47).	**Does not fulfill.** Provides no timber at this time.	**Fulfills.** Provides timber at this time and in a sustainable manner.
Develop timber sales that can be successfully offered to the market place.	**Does not fulfill.** Does not develop a timber sale.	**Fulfills.** Develops timber sale(s) that would be viable.
Retain elements that provide ecosystem diversity (snags, old growth trees, etc.) so that a healthy forest ecosystem can be maintained with habitat to support plant and animal populations (RMP p. 1, 20).	**Partially fulfills.** Retains existing elements, but does not enhance conditions to provide these elements for the future stand.	**Fulfills.** Retains the elements described under "no action" on untreated areas of the stands in the project areas and encourages development of larger diameter trees and more open stand conditions in treated areas. This adds an element of diversity to the landscape not provided on BLM lands as soon under the No Action alternative.
Increase protection for the public, facilities and high-value resources from large intense wildfires in rural/urban interface and high-use recreation areas in accordance with the National Fire Plan's Healthy Forest Initiative and Restoration Act.	**Does not fulfill.** Dense forest stands with high crown densities are more susceptible to a high intensity, stand replacement wildfire that escapes initial attack and could threaten the public and other resources.	**Fulfills.** Managed, thinned forest stands are less prone to catastrophic wildfires. Fires that do start tend to be easier to control in managed stands. Maintaining logging roads provides faster access for suppression forces if a fire does start.
Develop future large coarse woody debris, snag habitat, in-stream large wood and other elements of late-successional forest habitat. (RMP p.1)	**Fulfills**, but not as soon. Trees would continue to grow slowly until reaching suitable size.	**Fulfills.** Would develop large trees that could become high value CWD 10-30 years sooner by concentrating stand growth on fewer stems.

Purpose and Need (Section 1.2)	*No Action*	*Proposed Action*
Develop structural and spatial stand diversity on a landscape level in the long term.	**Fulfills** by maintaining current trends that would develop diversity slowly.	**Fulfills** by accelerating changes in some parts of some stands to develop more elements of diversity faster.
Provide appropriate access for timber harvest, silvicultural practices, and fire protection vehicles.	**Fulfills.** The basic road network exists and most of the roads can be used.	**Fulfills.** Existing roads would be maintained for travel and culvert upgrades would reduce potential for crossing failures.
Reduce potential human sources of wildfire ignition by controlling access.	**Partially fulfills**. Many of the road systems are currently gated. Low levels of activity fuels along roads would be maintained. Unauthorized OHV roads would continue to provide access to potential ignition sources away from roads.	**Fulfills**. Potential ignition sources created by logging would be mitigated where public access is available. Fewer unauthorized OHV roads would be accessible.
Reduce adverse environmental effects associated with identified existing roads within the project areas (RMP p. 11).	**Fulfills.** No active problems have been identified for any existing roads.	**Fulfills.** In addition to maintaining roads to prevent development of adverse effects associated with roads, culvert upgrades would reduce potential for catastrophic failure of stream crossings in high flow events. Removal of log fill would reduce potential for catastrophic failure of this crossing.

4.0 LIST OF PREPARERS

Resource	*Name*	*Initials*
Silviculture	Dan Schlottmann	RH (NRSA) for DS
	Dave Rosling (Retired)	
	Lisa Reynolds	
Cultural Resources	Pete Hazen	
	Steve DeFord	(NRSA) for SD
Hydrology/ Water Quality/Soils	Patrick Hawe	WPH
Botany TES and Special Attention Plant Species	Terry Fennell	
Wildlife TES and Special Attention Animal Species	Jim England	
Fire/Fuels	Barbara Raible	RH for BR
Fisheries	Dave Roberts	DAR
Recreation, Visual Resources Management and Rural Interface	Zachary Jarrett	
Logging	Keith Walton	
	Randy Herrin	CDS for RH
Engineering	Dan Nevin	

5.0 CONTACTS AND CONSULTATION

5.1 Consultation

5.1.1 ESA Section 7 Consultation

5.1.1.1 US Fish and Wildlife Service

The timber sale was submitted for Formal Consultation with U.S. Fish and Wildlife Service (USFWS) as provided in Section 7 of the Endangered Species Act (ESA) of 1973 (16U.S.C. 1536 (a)(2) and (a)(4) as amended).

Beeline and McDowell Creek were submitted during the FY2007/2008 consultation process. *The Batched Biological Assessment for Projects with the Potential to Modify the Habitat of the Northern Spotted Owl, Willamette Province, FY 2007-2008* (BA), was submitted in July 2006. Using effect determination guidelines, the BA concluded that overall, the Beeline and McDowell Creek thinnings may affect, but are not likely to adversely affect the northern spotted owl due to the modification of dispersal habitat (BA, pp. 40-41, 44-45).

The Biological Opinion (BO) associated with these projects was issued in September 2006 (reference # 1-7-06-F-0179). The BO concluded that these thinnings would not jeopardize the continued survival of the spotted owl (p. 95). None of the proposed units are located in Critical Habitat for the northern spotted owl.

The proposed thinnings and connected actions described in this EA have incorporated the applicable Management Standards that were described in the BA (p. 10) and BO (Section 1.2, pp. 18-19). In addition, this project would be in compliance with the general standards set forth in the BA (p. 6) and the BO (pp. 17-18), including monitoring and reporting on the implementation of this project and any adverse effects. The BO concluded that there would be no proposed Reasonable and Prudent Measures and Terms and Conditions would not be applicable since Management Standards common to all activities were developed which included measures to reduce incidental take (p. 97). In addition, as a design feature of this project, the discretionary Conservation Measure set forth in the BO (p. 97) would be implemented. This includes a seasonal restriction to delay activities associated with disturbance later into the nesting season.

5.1.1.2 NOAA Fisheries (NMFS)

Potential effects of the thinning and connected actions that could affect the listed fish species are related to sediment inputs associated with road repair /decommissioning, culvert replacement/removal and timber hauling.

See Table 15, Endangered Species Act Determinations of Effect for Upper Willamette River (UWR) chinook salmon, UWR steelhead trout, Lower Columbia River (LCR) coho salmon, LCR chinook salmon and LCR steelhead trout.

Table 15 - Endangered Species Act Determinations of Effect for Upper Willamette River Chinook Salmon And Upper Willamette River Steelhead Trout

Species	*Project Area*	*Effect Call*	*Remarks*
Upper Willamette River (UWR) chinook salmon, UWR steelhead trout, Lower Columbia River (LCR) coho salmon, LCR chinook salmon, LCR steelhead trout	Beeline	No Effect	*See EA Section 3.2.3*
UWR chinook salmon, UWR steelhead trout	McDowell Creek	No Effect	*See EA Sections 3.2.3*

Determination of Effect for ESA Listed Fish Species by Project Area

The projects would have "**no effect**" on UWR steelhead trout, UWR chinook salmon, LCR coho salmon, LCR Chinook salmon or LCR steelhead trout. Consultation with NOAA Fisheries on the potential effects of the projects on those species would not be required. Although sediment would increase in the project areas in the short-term as a result of replacing live stream culverts, the effect would decrease in the long-term, having no lasting effect on fish or fish habitat. Sediment inputs to streams from hauling are expected to be minimized by suspending hauling when an elevated risk of water and sediment flowing in roadside ditches exists. No sediment increases are anticipated downstream where ESA listed fish habitat may be found (*EA Section 3.2.3*).

The projects would also have **"no effect"** on Critical Habitat for the species listed above, or on Essential Fish Habitat as designated under the Magnuson-Stevens Fishery Conservation Act. The determinations of "no effect" are based primarily on the location of the proposed actions relative to ESA listed species distributions. In the Beeline project area, all of the proposed harvest units are at least three miles upstream of habitat that may be occupied by ESA listed fish species. In the McDowell Creek project area, all units are located at least 1.25 miles upstream of habitat that may be occupied by ESA listed fish species, and all but two units are located at least 2.25 miles upstream. In addition to location of the project units, the determinations of "no effect" are based on project design features that would prevent increases in sediment input to stream reaches potentially occupied by ESA listed fish species, or increases in stream turbidity or temperature.

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

5.1.2.1 Cultural Resources

Cultural Resource surveys were conducted from July 2004 through 2005 of April. Inventory reports show no finding of any cultural resource within the proposed project area.
All Surveys were reviewed and signed by District Archeologist. The tracking form was signed by Cascades Resource Area Field Manager.

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

Scoping letters were sent on to federal, state and municipal government agencies, nearby landowners, tribal authorities, and interested parties on the Cascades Resource Area mailing list. The letters described a summary of the Proposed Action for each project area, and included maps.

5.2.1 Response to Scoping Concerns/ Comments:

Letters and scoping comments were received from three organizations, one individual, and the Confederated Tribes of Grande Ronde. Substantive comments were grouped for response.

1. **Thinning on Matrix LUA:**

- K.S. (an individual): Thinning is OK, but no harvest of mature or old-growth trees. Use a diameter limit on stands 76-95 years old to ensure not harvesting mature/old-growth.
- Oregon Wild: Use Variable Density Thinning (VDT) and manage for habitat and decadence. Thin only where needed ecologically. VDT includes ¼ - ½ acre gaps, and range of low density to high density retention.
- Bark: Log only young plantations.
- American Forest Resource Council (AFRC): Be sure that harvest is economically viable. Encourages use of regeneration harvest for mature stands. Use small patch cuts for deer and elk forage within thinned stands.

Response: The proposed treatments were evaluated by the IDT to fulfill the Purpose of and Need for Action for the Matrix Land Use Allocation (*EA section 1.2*) and Decision Criteria/Project Objectives (*EA section 1.2.1*). The IDT developed the Proposed Action to commercially thin from below (*EA Section 2.2*) with Design Features developed to achieve resource objectives with an economically viable timber sale (*EA section 2.2.3*). The Affected Environment and Environmental Effects for the resources directly involved in these comments are described in the following sections:

- Vegetation and Forest Stand Characteristics (*EA section 3.2.1*)
- Wildlife (*EA section 3.2.5*)

2. **Treatment in Riparian Reserves:**

- K.S.: No entry into Riparian Reserves.
- Oregon Wild: Encourage young stand thinning to enhance structure as long as it can be done without impacting water quality and aquatic habitat.
- Bark: 50 foot buffers on all streams. Conservative action. Course wood placement and in-stream fish habitat improvements are the biggest need.
- AFRC: Riparian Reserves are not addressed separate from timber harvest.

Response: The proposed treatments were evaluated by the IDT to fulfill the Purpose of and Need for Action for the Riparian Reserve Land Use Allocation (*EA section 1.2*) and Decision Criteria/Project Objectives (*EA section 1.2.1*). The IDT developed the Proposed Action to implement variable density thinning in portions of the Riparian Reserve that are contiguous with Matrix harvest units (*EA section 2.2*) with Design Features developed to achieve specific resource objectives as part of an economically viable timber sale (*EA section 2.2.3*).

The Affected Environment and Environmental Effects for the resources directly involved in these comments are described in the following sections:

- Vegetation and Forest Stand Characteristics (*EA section 3.2.1*)
- Hydrology (*EA section 3.2.2*)
- Fisheries and Aquatic Habitat (*EA section 3.2.3*)
- Wildlife (*EA section 3.2.5*)

3. **Wildlife Habitat, Old-Growth Trees, Snags, CWD**

- K.S.: Mature and Old-Growth trees should not be harvested. BLM lands are particularly important for protecting proper ecosystem function.
- Oregon Wild: VDT achieves wildlife objectives, especially northern spotted owl dispersal. Protect remnant older trees and snags. Survey for Special Status Species.
- Bark: Retain ALL snags.
- AFRC: Provide forage for ungulates by creating patch cuts since forage in thinned stands is not adequate.

Response: The IDT developed the Proposed Action (*EA section 2.2*), Connected Actions (*EA section 2.2.1*) and Design Features (*EA section 2.2.3*) to incorporate the elements of the Purpose and Need (*EA section 1.2*) and Decision Criteria (*EA section 1.2.1*) that pertain to these resources. The Affected Environment and Environmental Effects for the resources directly involved in these comments are described in the following sections:

- Vegetation and Forest Stand Characteristics (*EA section 3.2.1*)
- Wildlife (*EA section 3.2.5*)

4. **Roads: Construction, renovation, decommissioning, etc.**

- K.S.: Obliterate new road. Decommission some existing roads, especially near streams.
- Oregon Wild: Temporary roads are better than permanent roads, but still cause problems. Carefully evaluate every new road for necessity (length of road v. acres reached).
- Bark: No new roads. Reduce overall road density.
- AFRC: New roads are often necessary for cost effective logging. Roads provide access for wildfire control. Do not decommission permanent roads. Allow for improved roads used for winter logging.

Response: The requirements for the road system needed to fulfill the Purpose of and Need for Action (*EA section 1.2*) and Decision Criteria/Project Objectives (*EA section 1.2.1*) were evaluated by the IDT and are described in Connected Actions (*EA section 2.2.1*, item 1). The IDT developed Design Features (*EA section 2.2.3*) to achieve resource objectives with an environmentally sound road system that would facilitate an economically viable timber sale and provide access for wildfire control. The Affected Environment and Environmental Effects for the resources directly involved in these comments are described in the following sections:

- Vegetation and Forest Stand Characteristics (*EA section 3.2.1*)
- Hydrology (*EA section 3.2.2*)
- Fisheries and Aquatic Habitat (*EA section 3.2.3*)
- Soils (*EA section 3.2.4*)
- Wildlife (*EA section 3.2.5*)
- Fire Hazard/Risk (*EA section 3.2.6*)

5. **Cultural Resources:** The Confederated Tribes of Grande Ronde expressed concern that based on the maps; Beeline might impact cultural values of the Table Rock Area.

***Response*:** The Beeline project is actually far from the Table Rock area and is separated by multiple ridges, drainages, road systems and private as well as public forest lands. There is no known connection with the cultural values associated with the Table Rock area.

5.2.2 EA Public Comment Period

The EA and FONSI will be made available for public review ***March 21, 2007*** to ***April 20, 2007***. The notice for public comment will be published in a legal notice in the *Molalla Pioneer* and *Albany Democrat Herald* newspapers. Written comments should be addressed to Rudy Hefter, Acting Field Manager, Cascades Resource Area, 1717 Fabry Road S.., Salem, Oregon 97306. Emailed comments may be sent to OR_Salem_Mail@blm.gov. Attention: Rudy Hefter

6.0 LIST OF INTERDISCIPLINARY TEAM REPORTS AND COMMON ACRONYMS

6.1 Interdisciplinary Team Reports

Interdisciplinary team reports can be found in the Beeline and McDowell Creek Thinning EA project file and are available for review at the Salem District Office.

Fennell, T., 2007. *Cascade Resource Area Botanical Report – 2007 McDowell Creek T.S.* Cascades Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Fennell, T., 2007. *Cascade Resource Area Botanical Report – 2007 Beeline T.S.* Cascades Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Jarret, Z., 2007. *2007 Timber Sale Thinning EA – Recreation, Visual and Rural Interface Resources Report.* Cascades Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Raible, B. 2007. *2007 Timber Sale Thinning EA - Fuels Management /Fire Ecology Fuels and Air Quality Report* [Fuels Report], Cascades Resource Area, Salem District, Bureau of Land Management. Salem, OR.

England, J., Irving, J., and S. Dowlan, 2006. *2007 Timber Sale Thinning EA* – [Wildlife Report] Cascades Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Hawe, P., 2006. *Hydrology/Channels/Water quality reports:* 2007 Timber Sale Thinning EA- [Hydrology Report] McDowell Creek, Cascades Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Hawe, P., 2006. *Hydrology/Channels/Water quality reports:* 2007 Timber Sale Thinning EA – [Hydrology Report] Beeline, Cascades Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Hawe, P. 2006. *2007 Timber Sale Thinning EA Soils Report.* [Soils Report] Cascades Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Roberts, D., 2006. *2007 Timber Sale Thinning EA -Fisheries and Aquatic Habitat.* [Fisheries Report] Cascades Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Rosling, D., 2006. *McDowell Creek Silvicultural Prescriptions – 2007 Timber Sale Thinning EA.* [Silvicultural Prescription] Cascades Resource Area, Salem District, Bureau of Land Management. Salem, OR.

Schlottmann, D., 2006. *Beeline Silvicultural Prescriptions – 2007 Timber Sale Thinning EA.* [Silvicultural Prescription] Cascades Resource Area, Salem District, Bureau of Land Management. Salem, OR.

6.2 Common Acronyms

ACS – Aquatic Conservation Strategy
BLM – Bureau of Land Management
BMP – Best Management Practice(s)
BO – Biological Opinion
BS – Bureau Sensitive, a category of species under the Oregon/Washington Special Status Species Policy
CONN – Connectivity land use allocation (Matrix)
CWD – Coarse Woody Debris
DBH – Diameter Breast Height
EA - Environmental Assessment
ESA – Endangered Species Act
FONSI – Finding of No Significant Impact
GFMA – General Forest Management Area land use allocation (Matrix)
NEPA – National Environmental Policy Act (1969)
NOAA – National Oceanic Atmospheric Administration (National Marine Fisheries Service [NMFS] is now called NOAA Fisheries)
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
PSZ – primary shade zone
RIA – Rural-Urban Interface
RMP – Salem District Record of Decision and Resource Management Plan (1995)
RMP/FEIS – Salem District Proposed Resource Management Plan / Final Environmental Impact Statement (1994)
ROW – Right-of-Way (roads)
RR – Riparian Reserve Land Use Allocation (Riparian Reserves)

SPZ – Stream Protection Zone (no-cut protection zone/no-cut buffer/no-treatment Zone /stream buffer)
TMDL – total maximum daily load
USDI – United States Department of the Interior
USFS – United States Forest Service
USFWS – United States Fish and Wildlife Service
WUI – Wildland-Urban Interface

7.0 ADDITIONAL SUPPORTING DATA

7.1 Tables

7.1.1 Vegetation

Table 16 - Beeline Vegetation Summary

Unit	*Size in Acres*[1]	*Current Stand Age Class*	*Average Diameter (in inches)*	*Trees/ Acre*		*Basal Area/ Acre*	
				Current	*After Treatment*	*Current*	*After Treatment*
3A	14	50 (41-50)	14in.	241	142-174	240	174-213
10A	14	50	11in	378	198-243	250	156-191
10B,C	77	50	13in	362	158-193	301	168-206
17A (part)	24	50	12in	442	198-243	333	156-191
17A (part)	98	60 (51-60)	15in	271	118-144	327	186-227
21A (part)	63	60	13in	334	176-215	277	162-198
21A (part), B	179	60	14in	260	142-174	259	174-213

1. Unit acres may differ from total project acres due to rounding.

Table 17 - McDowell Creek Vegetation Summary

Unit	*Size in Acres*[2]	*Current Stand Age Class*	*Average Diameter*	*Trees/ Acre*		*Basal Area/ Acre*	
				Current	*After Treatment*	*Current*	*After Treatment*
21A	18	60 (51-60)	19in	139	60-70	282	160-180
21ARR	3	60	19in	139	40/70/100	282	Variable
21B	17	60	21in	116	60-70	270	160-180
21BRR	1	60	21in	116	40/70/100	270	Variable
21C	21	60	12in	355	60-70	282	160-180
25A	31	50 (41-50)	13in	262	80-100	231	140-160
25ARR	6	50	13in	262	40/70/100	231	Variable
25B	15	50	12in	301	80-100	216	140-160
25BRR	5	50	12in	301	40/70/100	216	Variable
25C	235	70 (61-70)	18in	170	60-70	287	160-180
25CRR	23	70	18in	170	40/70/100	287	Variable
25D	60	70	17in	144	40/70/100	231	Variable
25DRR	12	70	17in	144	40/70/100	231	Variable

Unit	*Size in Acres*[2]	*Current Stand Age Class*	*Average Diameter*	*Trees/ Acre*		*Basal Area/ Acre*	
				Current	*After Treatment*	*Current*	*After Treatment*
27A	46	60	19in	137	60-70	281	160-180
27ARR	4	60	19in	137	40/70/100	281	Variable
27B	12	80 (71-80)	19in	140	60-70	260	160-180
27BRR	4	80	19in	140	40/70/100	260	Variable
27C	13	70	21in	123	40/70/100	304	160-180
27CRR	2	70	21in	123	40/70/100	304	Variable

1. Unit acres differ from total project acres due to rounding.

7.1.2 Fisheries and Aquatic Habitat

Source*: 2007 Timber Sale Thinning EA - Fisheries and Aquatic Habitat (Fisheries Report)*

Table 18 - In-Water Work Period for Affected Watersheds

Watershed	*Project Area*	*In-water Work Period*
Lower Clackamas River	Beeline	July 15th-August 31st
Lower Mollalla River	Beeline	July 15th-August 31st
Upper Molalla River	Beeline	July 15th-August 31st
Hamilton Creek/ South Santiam	McDowell Creek	July 15th-September 30th

Table 19 – Distances to ESA Listed Fish Habitat

Table 19 shows approximate distances downstream from proposed project units to the nearest potential resident and ESA listed fish habitat[1] (distance estimates in miles unless stated in feet)

Unit Number	Dist. to resident cutthroat trout habitat	Dist. to steelhead habitat	Dist. to coho habitat	Dist. to chinook habitat
BLN 3A	0.5 in Clear Cr. & Little Clear Cr.	3 in Clear Cr.	3 in Clear Cr.	20 in Clear Cr.
BLN 10B, C	Min. 60' on Clear Cr.	4 in Clear Cr.	4 in Clear Cr.	21 in Clear Cr.
BLN 21A	Min. 60' on Canyon Cr.	3.5 in Canyon Cr.	N/A[2]	21 in Milk Cr.
BLN 21C	~400' on Canyon Cr.	3.75 in Canyon Cr.	N/A	21 in Milk Cr.
MCD 21B	1.25 in Hamilton Cr.	1.25 in Hamilton Cr.	N/A	5.5 in Hamilton Cr.
MCD 21C	0.3 in SF Scott Cr.	1.7 in Hamilton Cr.	N/A	6 in Hamilton Cr.
MCD 21E	~100' on SF Scott Cr.	2.25 in Hamilton Cr.	N/A	7.3 in Hamilton Cr.
MCD 25A	Min. 60' on SF Scott Cr.	4.3 in Hamilton Cr.	N/A	9.6 in Hamilton Cr.
MCD 25B	Min. 60' on SF Scott Cr.	4.9 in Hamilton Cr.	N/A	10.2 in Hamilton Cr.
MCD 25C	Min. 60' on SF Scott Cr.	3.7 in McDowell Cr.	N/A	6.75 in McDowell Cr.
MCD 25D	0.3 in McDowell Cr.	3 in McDowell Cr.	N/A	6 in McDowell Cr.
MCD 27A	1.25 in Jack Cr.	3.1 in Hamilton Cr.	N/A	5.5 in Hamilton Cr.
MCD 27B	0.6 in Jack Cr.	2.7 in Hamilton Cr.	N/A	5.25 in Hamilton Cr.
MCD 27C	1.25 in Jack Cr.	3.5 in Hamilton Cr.	N/A	5.75 in Hamilton Cr.

[1] Upstream limits of anadromous fish distribution are obtained from *streamnet.org.* Stream distances are stream reach lengths summed in ArcGis.
[2] Not applicable. No native coho are not found in watersheds upstream of Willamette Falls.

7.1.3 Wildlife

Source: *2007 Timber Sale Thinning EA- Wildlife report*

Table 20 - Summary of Special Habitats, Remnants, and Coarse Woody Debris (CWD)

Name/Unit#	*Location*	*Seral Stage*	*Remnant Old Growth*	*Special Habitats**	*CWD****
Beeline					
3A	5S-4E-03	Mid	No	No	<60'/240'+
10A	5S-4E-10	Mid	No	No	0'/240'
10B-C	5S-4E-10	Mid	No	No	0'/180'
17A	5S-4E-17	Mid	No	No	0'/180'
21A-B	5S-4E-21	Mid	No	No	0"+/240'
McDowell					
21A-C	12S-1E-21	Mid	No	No	0'/200'
25A-B	12S-1E-25	Mid	No	No	0'/200'
25C-D	12S-1E-25	Mid	Yes	No	90'/500'+
27A-C	12S-1E-27	Mid	No	No	<60'/240'+

Seral Stage Age Classes (years) based on Stand Exam data: Early Seral = 0-30; Early Mid Seral = 30-40; Mid Seral = 40 – 60; Late Mid Seral = 60 -80; Early Mature Seral = 80 - 120; Mature = 120 - 200; Old Growth =200+
* Special habitats within the units include: wet and dry meadows, talus, cliffs & rock outcrops.
\# Presence of adjacent special habitat, wetland, pond adequately protected with no treatment buffer.
*** Linear ft/acre >19" dbh & >20' long, hard (decay classes 1-2)/soft (decay classes 3-5) logs.

Table 21 - Summary of Snags Currently Available By Project Area

Snags At Least 15' Tall/100 Acres						
Section (all units)	Hard snags 15-25"	Soft snags 15-25"	Hard snags 25"+	Soft snags 25"+	Total hard snags 15"+	Total soft snags 15"+
Beeline						
5S-4E-3	0	0+	0	0	0	0+
5S-4E-10	0+	125	0	0	0+	125
5S-4E-17	0+	0+	0	0	0+	0+
5S-4E-21	0+	0+	0	0+	0+	0+
McDowell Creek						
12S-1E-21	170	0+	0	0	170	0+
12S-1E-25	<100	0	0+	<100	100	<100
12S-1E-27	0+	0+	0	0	0+	0+