Middle South Umpqua/Dumont Creek Commercial Thinning and Density Management Environmental Assessment

Bureau of Land Management
Roseburg District Office
South River Field Office
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U.S. Department of the Interior, Bureau of Land Management
Roseburg District Office
777 NW Garden Valley Blvd.
Roseburg, Oregon 97471

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Chapter One
PURPOSE AND NEED FOR ACTION

I. Background

The analysis area encompasses lands managed by the South River Field Office of the Roseburg District, Bureau of Land Management (BLM) located in the South Umpqua River – Dompier Creek and Deadman Creek six-field subwatersheds of the Middle South Umpqua/Dumont Creek fifth-field watershed, which is a Tier 1 Key Watershed.

Historic and present-day conditions of natural resources in the two subwatersheds are described in the Deadman/Dompier Watershed Analysis (WA (USDI, BLM 1997)). Except for forest seral stages which can change rapidly as a consequence of timber harvest and wildfire, the 1997 characterization of resource conditions is generally representative of present-day conditions.

The present forest seral stage conditions across the entire watershed were derived from several sets of data. Updated descriptions for BLM-administered lands are derived from the current Forest Operational Inventory. The present condition of private lands and lands under the administration of the Umpqua National Forest were derived using 2004 change detection data in conjunction with examination and GIS analysis of 2005 satellite imagery.

II. Proposed Action

The proposed action is the commercial thinning and density management, from below, of approximately 290 acres of mid-seral forest stands. Treatments would be applied in the Matrix allocations and associated Riparian Reserves.

Two of the units proposed for treatment are on lands in the Connectivity/Diversity Block land use allocation in Section 3, T. 30 S., R. 2 W., W.M.. The remaining units in Sections 21 and 33, T. 29 S., R. 2 W., W.M. and Sections 9, 11 and 15, T. 30 S., R. 2 W., W.M. are on lands in the General Forest Management Area.

III. Objectives

Timber management on the Revested Oregon and California Railroad Lands (O&C Lands) managed by the South River Field Office is principally authorized and guided by:

The Oregon and California Act of 1937: Section 1 of the O&C Act (43 USC § 1181a) which stipulates that O & C Lands be managed "… for permanent forest production, and the timber thereon shall be sold, cut, and removed in conformity with the principal of sustained yield for the purpose of providing a permanent source of timber supply, protecting watersheds, regulating stream flow, and contributing to the economic stability of local communities and industries, and providing recreational facilities…"

The Federal Land Policy and Management Act (FLPMA): Section 302 at 43 U.S.C. 1732(a), directs that "The Secretary shall manage the public lands . . .in accordance with the land use plans developed by him under section 202 of this Act when they are available . . ."

Roseburg District Record of Decision/Resource Management Plan (ROD/RMP): The ROD/RMP (USDI, BLM 1995a), approved in accordance with the requirements of FLPMA, provides specific direction for timber management.

The proposed action is necessary to conform with management direction from the ROD/RMP (p. 60) which directs that in the Matrix developing stands be managed to promote tree survival and growth to achieve a balance between wood volume production, quality of wood, and timber value at harvest by implementation of actions that include commercial thinning and density management designed to reduce competition among remaining trees. Specific to this direction:

- In the General Forest Management Area (GFMA), commercial thinning would be programmed in stands under 80 years of age and would be designed to assure high levels of timber volume productivity (ROD/RMP, p. 151);
- In Connectivity/Diversity Blocks (C/D Block), commercial thinning would be undertaken in stands up to 120 years of age and usually designed to assure high levels of timber volume productivity (ROD/RMP, p. 153); and
- In Riparian Reserves, density management is to be applied to control stocking levels, establish and manage non-conifer vegetation, and acquire vegetation characteristics consistent with Aquatic Conservation Strategy objectives (ROD/RMP, pp. 153-154).

IV. Decision Factors

Factors to be considered will include:

- The degree to which the described objectives would be achieved, including: harvest prescription; the manner of harvest with respect to the types of equipment and yarding methods employed; seasons of operation; and the manner of access, including road renovation, and the type and location of any new road construction;
- The nature and intensity of environmental impacts that would result from implementation of the proposed action, and the nature and effectiveness of measures to minimize impacts to resources that may include, but would not necessarily be limited to wildlife and wildlife habitat, aquatic habitat, soil productivity, water quality, and air quality;
- Compliance with ROD/RMP management direction, terms of consultation on species listed and critical habitat designated under the Endangered Species Act; the Clean Water Act; Clean Air Act, Safe Drinking Water Act, O&C Act, and other BLM programs such as Special Status Species; and
- How to provide timber resources in support of local industry, and provide revenue to the Federal and County governments from the sale of those resources while reducing short-term and long-term costs of managing the lands in the project area.

V. Conformance

This environmental assessment will consider and compare the environmental consequences of both the proposed action and no action alternatives. It will provide sufficient evidence for determining whether to prepare a finding of no significant impact or, if anticipated impacts would exceed those considered and adopted in the Roseburg District PRMP/EIS, preparation of a Supplemental Environmental Impact Statement (SEIS).

In addition to the PRMP/EIS, this analysis tiers to assumptions and analysis of consequences provided by:

- The *Final Supplemental Environmental Impact Statement* (FSEIS) *on Management of Habitat for Late-Successional and Old-Growth Related Species Within the Range of the Northern Spotted Owl* (USDA and USDI 1994a);

- The *Final Supplemental Environmental Impact Statement to the 2004 Supplemental Environmental Impact Statement to Remove or Modify the Survey and Manage Mitigation Measures Standards and Guidelines* (USDA and USDI 2007).

In addition to statutory requirements, implementation of the proposed action would conform to the requirements of the ROD/RMP which incorporates as management direction the standards and guidelines of the *Record of Decision for Amendments* (ROD) *to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (USDA and USDI 1994b), as amended by the *Record of Decision to Remove the Survey and Manage Mitigation Measure Standards and Guidelines from Bureau of Land management Resource Management Plans Within the Range of the Northern Spotted Owl* (USDI, BLM 2007).

Chapter Two
DISCUSSION OF THE ALTERNATIVES

I. Alternative One - No Action

Under this alternative, commercial thinning and density management would not be applied to the units being considered for treatment under the proposed action. The stands would continue to develop along present growth trajectories characterized by dense and overstocked conditions and high levels of canopy closure. Over time, the persistence of such conditions would lead to increased mortality in suppressed trees combined with potential stagnation of overall stand growth, unless these trajectories were altered by a natural disturbance such as wind or fire.

There would be no construction of roads to provide access for yarding and hauling of timber. Renovation or improvements to roads for reasons such as realignment for user safety, or correction of drainage deficiencies to address erosion or water quality issues would not be undertaken, nor would the decommissioning of roads identified as surplus to long-term transportation and management needs. Road maintenance would be conducted on an as-needed basis to provide resource protection, accommodate reciprocal users, and protect government investment in the roads.

II. Alternative Two – The Proposed Action

As described in Chapter One, the proposed action consists of commercial thinning and density management on approximately 290 acres. Maps showing the location and configuration of the proposed units are contained in *Appendix A.*

A. Unit Design and Marking Prescriptions

Commercial thinning and density management would be designed to increase tree size through time, extend the age at which CMAI[1] is reached, and capture timber volume that would otherwise be lost to anticipated suppression mortality. Thinning would principally remove trees from the suppressed and intermediate canopy classes, although some co-dominant and dominant trees could be cut to achieve desired stand densities.

Generally, in the General Forest Management Area and Connectivity/Diversity Block land use allocations where timber production is a primary objective, the healthiest, best-formed trees would be favored for retention and generally have at least a 30 percent live crown ratio so that crown expansion and accelerated diameter growth would be more likely following thinning (Daniel, et. al. 1979). Older remnant trees that may be present are not the focus of commercial thinning and density management, and would be retained to the greatest degree practicable. Circumstances under which older remnant trees could be cut would be typically limited to: clearing of road rights-of-way; clearing landing areas; and removing the trees to address operational safety concerns subject to Oregon State laws and regulations.

[1] Culmination of mean annual increment (CMAI) is defined as the age in the growth cycle of a tree or stand at which the mean annual increment for height, diameter, basal area, or volume is at a maximum. (The Dictionary of Forestry The Society of American Foresters 1998)

Stands in the **General Forest Management Area** would be thinned to a relative density index[2], on average, of 0.35 to maximize stand volume growth. Approximately 35 percent of stand basal area would be removed while retaining about 100 trees per acre, on average. Canopy closure would be reduced by approximately one-third.

In **Connectivity/Diversity Block** units, relative density would be reduced to 0.25 to 0.30. A variable density prescription would be used to encourage development of structural diversity. It would be based on retention of 60 to 90 trees per acre and removal of up to 45 percent of stand basal area. Canopy closure would be reduced approximately ten percent more than in the lighter thinning applied in the General Forest Management Area. Large hardwood trees would be retained, as available, to contribute toward the future objective of providing an average of two per acre for retention at regeneration harvest. The stands would be evaluated for the need to under-plant to help create a secondary canopy layer. Indigenous conifers such as Douglas-fir, incense-cedar, sugar pine and ponderosa pine would be used.

Riparian Reserves would be established on all intermittent and perennial streams within or adjacent to the proposed units. The widths would be based on the site-potential tree height for the watershed which is calculated from the average site index of inventory plots on lands capable of supporting commercial timber stands, located throughout the watershed. The site-potential tree height has been calculated as 180 feet for the Middle South Umpqua River/Dumont Creek fifth-field watershed (WA, p. 8).

On streams that are not fish-bearing, Riparian Reserve widths would be 180 feet wide, slope-distance, measured from the top of the stream bank. Riparian Reserve widths on intermittent and perennial streams that are fish-bearing would be 360 feet.

Variable-width "no-harvest" buffers would be established within all Riparian Reserves to protect stream bank integrity, maintain streamside shade, and provide a filtering strip for overland run-off. Buffers would be a minimum slope distance of 20 feet in width on intermittent non-fish-bearing streams and 50 feet in width on fish-bearing streams, whether intermittent or perennial. The buffer widths would be measured from the top of the stream bank. Other considerations used in determining final buffer widths would include: presence of unique habitat features and vegetation; streamside topography; stream susceptibility to solar heating; and proximity to Essential Fish Habitat and critical habitat for the Federally-threatened Oregon Coast coho salmon.

To prevent soil disturbance and displacement that could result in sedimentation, no ground-based operations would be allowed within the "no-harvest" buffers. Clearing of cable yarding corridors through the buffers would be authorized where a demonstrated need existed. Trees cut within the buffers for this purpose would be left on site for potential in-stream recruitment and protection of stream banks. Corridors would be a maximum of 20 feet wide and laid out perpendicular to stream channels at locations and in a manner approved by the contract administrator. Trees outside of the "no-harvest" buffers designated for cutting and removal would be felled away from the buffers.

[2] Relative density index compares current stand density with the theoretical maximum density. In general terms, for a given average diameter, a stand can support a maximum number of trees per acre. Conversely, for a given number of trees per acre, there is a maximum average diameter possible.

Outside of the "no-harvest" buffers, a variable density prescription, similar to that used in Connectivity/Diversity Block units, would be designed to accelerate individual tree growth, allow understory development, and hasten development of late-seral conditions. Tree selection would not be based solely on form and could include trees with broken or deformed tops. Hardwoods and less common conifers would receive preferential consideration for retention.

In all land use allocations contract provisions would stipulate the reservation of all existing Class 3, 4 and 5 large down wood. Where present, sound conifer and hardwood snags at least16 inches in diameter breast height and 20 feet tall would be would be retained as practical. In Riparian Reserves, snag protection could include designation of a ring of rub trees around snags or enclosure in unthinned areas.

Circumstances where snag retention would not be viable would include: proximity to roads and landings posing operational safety concerns subject to Oregon State laws and regulations; location in a proposed road right-of-way where no other reasonable access exists; and where retention and protection would preclude achievement of silvicultural objectives for thinning and density management. Snags felled in Riparian Reserves would be retained on site for potential future recruitment as in-stream wood.

Table 2-1 provides a general description of the proposed units by: unit identifier; principal land use allocation; approximate acreage; anticipated yarding method; potential spotted owl habitat effects, and seasonal restrictions on harvest and hauling.

Table 2-1 Proposed Commercial Thinning and Density Management Units

Unit ID No.	Land Use Allocation	Unit Acres	Yarding Method	Potential Suitable Habitat Removal	Adjacent Suitable Habitat	Seasonal Restrictions*
29-2-21A	GFMA	32	Cable	Tailhold trees	Yes	1, 3, 4, 5
29-2-33A	GFMA	13	Cable	Guyline trees	Yes	1, 2 (above Road 32.0), 3, 4, and 5
30-2-3A	C/D Block	14	Cable	No	No	1, and 3
30-2-3B	C/D Block	35	Cable	No	No	2 and 3
			Ground-Based	No	Yes	2, 3, and 5
30-2-9C	GFMA	39	Cable	No	No	1 and 3
			Ground-Based	No	No	2 and 3
30-2-11A	GFMA	51	Cable	Road Construction	Yes	1, 2, 3, 4, and 5
			Ground-Based		Yes	2, 3, and 5
30-2-15A	GFMA	31	Cable	No	Yes	1, 3, and 5
			Ground-Based	No	Yes	2, 3, and 5
30-2-15C	GFMA	40	Cable	No	Yes	1, 2 (above Road 14.0), 3, and 5
			Ground-Based	No	Yes	2, 3, and 5
30-2-15D	GFMA	33	Ground-Based	No	No	2, and 3

* See pages 8 and 9 for discussion

Unit 30-2-15Ais located partially within a Known Owl Activity Center. These are 100-acre reserves established on all spotted owl nest sites and activity centers that were known as of January 1st, 1994, and managed as unmapped Late-Successional Reserve.

Those portions of the unit that lie within the Known Owl Activity Center would be managed consistent with objectives found in the *South Umpqua River/Galesville Late-successional reserve Assessment* (USDA and USDI 1999 LSRA)), as amended in 2004. Density management treatments would be designed to mimic natural disturbances that reduce stand density to move stand development toward desired late-successional conditions described in the LSRA.

Thinning would generally remove trees from the suppressed and intermediate canopy classes, reserving trees 20 inches diameter breast height and larger. Proportional thinning across diameter classes could occur, though, if needed to achieve desired stand density and diameter distribution. Trees greater than 20 inches diameter breast height that are cut would be retained on site for coarse wood.

B. Access

Primary access would be provided by roads under BLM control and/or private roads over which the BLM has rights under reciprocal agreements. Approximately 0.9 miles of roads are proposed for renovation, to be blocked and decommissioned following conclusion of thinning operations. Additional access would be provided by five temporary spur roads totaling 0.9 miles in length. Table 2-2 summarizes proposed construction and renovation needs for individual units. Where no additional access is necessary, no entry is included.

Table 2-2 Proposed Road Renovation and Construction to or within Commercial Thinning and Density Management Units

Unit ID	Proposed Road Construction and/or Renovation	Road Length (miles)	Disposition Post-Harvest
29-2-33A	Renovation unsurfaced road	0.08	Block/Decommission
30-2-3B	One (1) temporary unsurfaced spur	0.07	Block/Decommission
	Renovate road within unit	0.43	Block/Decommission
30-2-11A	One (1) temporary unsurfaced spur	0.23	Block/Decommission
	Renovation portion of Road 30-2-11.0	0.38	Block/Decommission
30-2-15C	One (1) temporary unsurfaced spur	0.26	Block/Decommission
30-2-15D	Two (2) temporary unsurfaced spurs	0.34	Block/Decommission

Temporary spur roads would be located on ridge top or stable side slope locations. With the exception of one proposed road accessing the southern portion of proposed Unit 30-2-15D, which passes approximately 100 feet above the inception point of an intermittent stream, the temporary roads would be located entirely outside of Riparian Reserves. The running surface of temporary roads would typically be 14 feet in width. Clearing limits for the roads must provide a minimum of five feet of horizontal clearance on either side, and a minimum of ten feet of overhead clearance. Based upon these circumstances, the rights-of-way widths would be a minimum of 25 feet.

Other factors that would affect the clearing limits and require a wider right-of-way would include slope steepness, the need for turnouts, and providing a safe line-of-sight on approaches to curves. Where road gradients are less than six or seven percent, roads would be out-sloped for drainage in lieu of ditches and cross drains. Otherwise, road surfaces would be crowned and culverts installed at short intervals to quickly and evenly disperse run-off to the forest floor.

The intent is to construct, use and decommission unsurfaced temporary roads in the same operating season. If not possible because of events such as extended fire closure, the roads would be winterized prior to the onset of autumn rains for use the following year.

Road decommissioning would consist of, at a minimum, removal of any temporary drainage structures, construction of water bars, seeding and mulching, and blocking roads to vehicular use. Road beds may also be subsoiled depending upon individual site circumstances.

C. Yarding Methods

For ground-based operations, the following project design features would apply:

- Limited to slopes of 35 percent or less, on pre-designated trails, using existing trails to the greatest degree practicable. Operations on steeper pitches between gentler benches could be authorized;
- Ground-based harvest would be conducted with harvester/forwarder equipment; and
- Landings on temporary roads would be subsoiled in conjunction with decommissioning.

For cable yarding operations the following project design features would apply:

- Skyline systems would be capable of maintaining a minimum one-end log suspension. If necessary, contract requirements may specify the type of logging carriage to be used;
- Cable yarding equipment would have a minimum of 100 feet of lateral yarding capacity, and yarding corridors would be pre-designated.
- Landings would be located at least 200 feet apart to the extent practicable.

Cable yarding typically requires the use of trees located outside of unit boundaries for tailholds and guyline anchors. Tailhold trees seldom require cutting, and contract provisions require that purchasers obtain written approval before attaching logging equipment to any tree in the timber reserve, and take appropriate measures to protect the tree from undue damage. Protection measures could include the use of tree plates, straps or cribbing. Guyline trees are subject to state safety regulations as they are located in the guyline radius of cable yarding equipment, and as a general rule are always cut. Tailhold and guyline trees would not include: 1) known spotted owl nest trees, or adjacent trees providing habitat function, or 2) in Known Owl Activity Center P2203A any trees with nesting structure, or adjacent trees that provide habitat function.

D. Seasonal Operational Restrictions for Timber Harvest and Hauling

1) Operations are allowed throughout the year subject to any other seasonal restrictions that follow.
2) Ground-based operations or cable yarding to roads not suitable for all-weather hauling would be restricted to the period of May 15th to October 15th. Season of operations may be extended, subject to a provisional waiver, if weather conditions and soil moisture content warrant.
3) For commercial thinning and density management, felling and yarding of timber other than that associated with the clearing of road rights-of-way would generally be prohibited during the bark-slip period, from April 15th to July 15th.

4) Removal of suitable nesting, roosting and foraging habitat within one-quarter mile of **northern spotted owl** (*Strix occidentalis caurina*) known sites, estimated sites, or unsurveyed suitable habitat would be prohibited from March 1st to September 30th. This restriction could be waived earlier if surveys determine owls are not present, have not nested, or have failed in nesting attempts. The waiver would be valid until March 1 of the following year. If two years of protocol surveys do not detect owl presence or activity, restrictions may be waived the following two years (USDI, USFWS 1992 p. 2).
5) Operations within applicable disruption threshold distances of **northern spotted owl** known sites, estimated sites, or unsurveyed suitable spotted owl habitat would be seasonally restricted from March 1st to July 15th. This restriction could be waived until March 1st of the following year if surveys indicate owls are not present, not nesting, or have failed in a nesting attempt. If two years of protocol surveys do not detect owl presence or activity, restrictions may be waived the following two years.

E. Noxious Weeds and Invasive Non-Native Plants

Preventative measures would be implemented in conjunction with the proposed timber sales that focus on minimizing or eliminating the risk of introducing new weed infestations or spreading existing ones. These measures would include:

- Steam cleaning or pressure washing heavy equipment used in logging and road construction to remove soil and materials that could transport weed seed or root fragments;
- Scheduling work in uninfested areas prior to work in infested areas; and
- Seeding and mulching disturbed areas with native seed; or revegetating with native plant species where natural regeneration is unlikely to prevent weed establishment.

III. Alternatives and/or Actions Considered But Not Analyzed In Detail

A. Proposed Units Deferred from the Analysis

A total of six proposed units located in Sections 17, 20, 29 and 32 of T. 29 S., R. 2 W., W.M. and two in Sections 3 and 15, T. 30 S., R. 2 W., W.M. were deferred from any further consideration for reasons that included low stand density, small tree size, and/or insufficient volume to allow for an economical thinning entry.

B. Reservation of the Largest Trees in Riparian Reserves to Provide Down Wood and Snags

Comments received on previous commercial thinning and density management EAs have suggested that the BLM should establish an upper diameter limit for trees to be cut in Riparian Reserves, or alternately identify the largest of the trees to be thinned and reserve them for future large wood and snags.

This was not considered necessary because, as described on page 4, trees would primarily be removed from the suppressed and intermediate canopy classes. Although some co-dominant and dominant trees could be removed where necessary to meet specific density objectives, it is expected that these would be few in numbers.

IV. Resources That Would Remain Unaffected By Either Alternative

The following resources or critical elements of the human environment would not be affected under either alternative because they are absent from the project areas: Areas of Critical Environmental Concern (ACEC); prime or unique farmlands; floodplains; wilderness; waste, solid or hazardous; and Wild and Scenic Rivers.

The proposed action is consistent with Executive Order 12898 which addresses Environmental Justice in minority and low-income populations. The BLM has not identified any potential impacts to low-income or minority populations, either internally or through the public involvement process. No Native American religious concerns were identified by the team or through correspondence with local tribal governments.

As discussed on the preceding page and in the Chapter Three (p. 27), no measurable increase or decrease in the introduction or rate of spread of Noxious Weeds and Invasive Non-Native Plants is anticipated. Actions taken independently of the timber sales and under separate authorization will be implemented to contain, control and eradicate existing infestations regardless of whether or not decisions are made to implement the timber management proposed in this EA. Measures implemented through the timber sale contracts, discussed on page 9, would focus on preventing the introduction and establishment of new infestations.

There are no energy transmission or transport facilities, and/or utility rights-of-way in proximity to any of the proposed commercial thinning or density management unit. No commercially usable energy sources are known to exist in the project area. As a consequence, no adverse effect to any energy resources would be anticipated in association with either of the alternatives being analyzed in this environmental assessment.

Chapter Three
THE AFFECTED ENVIRONMENT

This chapter summarizes the specific resources that are present or potentially present and could be affected by the proposed action. The description of the current conditions inherently includes and represents the cumulative effects of past and current land management activities undertaken by the BLM and private entities.

I. Timber/Vegetation

Forest Conditions in the South Umpqua River/Dompier Creek and Deadman Creek Subwatersheds of the Middle South Umpqua/Dumont Creek Watershed

Combined, the South Umpqua River/Dompier Creek and Deadman Creek subwatersheds comprise an area of approximately 28,900 acres. Approximately 955 acres or three percent of the land base is considered non-forest.

The BLM manages 10,525 acres of which 99 percent is forested. This represents slightly more than 35 percent of the land base in the two subwatersheds. These lands are designated as General Forest Management Area, Connectivity/Diversity Block and Riparian Reserves. Early-seral forest less than 30 years of age accounts for 2,456 acres or 23.5 percent of BLM-managed lands. Mid-seral forest, 31 to 80 years of age, constitutes 2,625 acres or 25 percent, and the remaining 5,343 acres or 51.5 percent is mature and late-seral forest greater than 80 years of age.

The U.S. Forest Service manages 9,728 acres of which 98.5 percent is forested. This represents about 32.5 percent of the land base in the two subwatersheds. On lands managed by the U.S. Forest Service there are approximately 2,748 acres of early-seral forest, with 1,135 acres of mid-seral forest and 5,698 acres of mature and late-seral forest.

The remaining 8,645 acres consist of industrial forest lands, residential properties, small forest ownership, and agricultural lands. Approximately eight percent of the private lands are non-forest. Seral distribution on private lands is estimated at 1,023 acres of early-seral forest, approximately 6,327 acres of mid-seral forest, and 587 acres of mature and late-seral forest.

When all ownership is taken together, the two subwatersheds consist of 21.5 percent early-seral forest, 36.5 percent mid-seral forest, and 42 percent mature and late-seral forest.

The principal plant community identified in watershed analysis is Douglas-fir/Rhododendron-Ceanothus/Salal. Utilization of a plant association guidebook developed by Atzet et al (1996), in conjunction with data from timber stand exams and field reconnaissance indicate the following associations are also present.

- Douglas-fir - Golden Chinkapin/Dwarf Oregon-grape
- Douglas-fir/Salal/Pacific Rhodendron
- Western Hemlock-Golden Chinkapin/Salal-Pacific Rhododendron
- White fir/Salal - Dwarf Oregon-grape

Conditions within the proposed commercial thinning and density management units

The forest stands proposed for commercial thinning and density management are located between 2300 and 3300 feet in elevation, primarily on east and northeast aspects.

Timber stand exams were conducted in 2008, using the BLM Ecosurvey Stand Exam Program. The Organon Forest Stand Growth and Yield Model version 8.2 was used to estimate future stand growth and development and stand characteristics, such as trees per acre, DBH, relative density, canopy closure, mortality, and stand volume.

The proposed commercial thinning and density management units are dense, even-aged stands, approximately 35 to 45 years old, and dominated by Douglas-fir. Other conifers components are incense cedar, sugar pine, ponderosa pine and grand fir with occasional occurrences of western hemlock and western redcedar. Golden chinkapin, red alder, and madrone are the common hardwood components. Most of the stands were pre-commercially thinned and fertilized.

Ground cover and understory development is patchy and sparse. Understory shrubs include salal, Oregon-grape, rhododendron, red huckleberry, and vine maple. Herbaceous species include whipplevine, beargrass, western swordfern, bracken fern, rattlesnake-plantain, common prince's pine, oxalis, and vanilla leaf.

Relative stand density index in all stands is greater than 0.55. Relative density is a measure of stand stocking compared to a theoretical maximum. As a general rule, at a relative density of 0.55 or greater, competition among trees can result in suppression mortality and reduced tree vigor (Drew and Flewelling 1979). Diameter growth has slowed over the past five or more years, and the stands are experiencing suppression mortality as trees compete for sunlight, water and nutrients. Canopy closure is greater than 100 percent. [3]

Table 3-1 Average current conditions of the forest stands proposed for treatment.*

Unit	Age	Trees/Acre > 7" DBH	Basal Area (sq. ft./acre)	Quadratic Mean Diameter (inches)	Relative Density	Canopy Closure (percent)
29-2-21A (N½)	37	245	196	10.3	0.67	122
29-2-21A (S½)	38	213	194	12.9	0.61	120
29-2-33A	35	284	186	6.1	0.78	186
30-2-3A	40	291	204	9.8	0.71	120
30-2-3B	40	247	213	10.4	0.72	152
30-2-9C	46	173	156	8.6	0.57	113
30-2-11A	44	153	190	9.5	0.67	150
30-2-15A	41	210	182	11.6	0.59	124
30-2-15C	39	238	166	7.7	0.64	134
30-2-15D	39	236	190	12.1	0.61	138

* All values expressed are approximations of conditions throughout individual units.

[3] Canopy Closure is the proportion of the forest floor covered by the vertical projection of tree crowns, which is adjusted for crown overlap in closed canopy stands. The Organon model estimates canopy cover by summing the individual tree crown areas and dividing that by the area of an acre. Estimates can exceed 100 percent of the stand due to crown overlap in dense stands and/or the presence of understory trees.

Average live crown ratio is greater than 30 percent in the proposed treatment stands. A live crown ratio (proportion of live crown to total height of the tree) of 30 percent or greater is considered to be a level important for the tree's ability to respond to release from a thinning (Daniel, et. al. 1979).

II Wildlife

The two areas of concern for wildlife associated with the proposed action are Special Status Species and migratory birds.

A. Special Status Species

Two classes of Special Status Species receive particular consideration in BLM management actions. These are threatened and endangered species listed under the Endangered Species Act, and BLM Sensitive species designated under Manual 6840.

Twenty-four special status wildlife species are known or suspected to occur on the Roseburg District. The proposed action would have no effect on 17 of them because the project area is outside their range, suitable habitat is absent from the project area, or because riparian buffers would provide adequate protection; these species were eliminated from further consideration (Table B-1, *AppendixB - Wildlife*). The seven remaining special status species that may be affected by the proposed action are identified below.

1. Threatened and Endangered Species

The threatened **northern spotted owl** (*Strix occidentalis caurina*) is forest-dwelling raptor that preys primarily on small mammals (Forsman et al. 1984) and that generally inhabits forest stands with multiple shrub and canopy layers, large overstory trees, large snags, and accumulations of coarse woody debris.

Large broken-topped trees, cavities in trees and snags, or platforms in tree canopies provide nesting structures (Forsman et al 1984, Hershey et al. 1997). On the Roseburg District these features are generally found in forest stands over 80 years old. Stands containing these features that provide for nesting, roosting, and foraging are referred to as "suitable habitat."

Younger stands that provide sufficient canopy cover and sub-canopy space for spotted owl movement, but that do not provide sufficient late-seral components to support spotted owl nesting are referred to as "dispersal habitat." On the District, this is typically represented by stands 40-79 years old. Dispersal habitat may provide limited roosting and foraging opportunities, depending on site conditions and past management. Dispersal habitat near spotted owl sites is also important for connectivity among nearby patches of suitable habitat.

Forested stands that currently provide no function for spotted owls, but will develop into dispersal or suitable habitat in the future are called "unsuitable habitat." Generally these are stands aged 0-39 years on the District.

Areas such as rock outcrops and bodies of water that will never be capable of supporting spotted owl use are considered "non-habitat."

Because of their relatively small tree size, high tree density, and lack of nesting structure the proposed commercial thinning and density management units are composed exclusively of dispersal-only and unsuitable habitat. The proposed location for a temporary road that would provide access to the west side of Unit 30-2-11A originates on the edge of an unmanaged stand with suitable habitat components. All other proposed road construction would occur in unsuitable or dispersal habitat.

Information on the location and status of spotted owls in the project area is available from yearly NFP effectiveness monitoring surveys (Lint et al. 1999), which covers all suitable habitat within approximately 0.25 miles of the project area. Therefore, the proposed action would not affect any unsurveyed suitable spotted owl habitat.

Effects of habitat modification to specific spotted owl sites are assessed by assigning generalized nest patches with 300 meter radii, core areas with 0.5 mile radii, and home ranges with 1.2 mile radii in the Western Cascades physiographic province (USDI, USFWS 2007). Seven current or historic spotted owl home ranges overlap some portion of the project area as illustrated in Figure B-1 (*Appendix B - Wildlife*).

Habitat availability for the core areas and home ranges is detailed in Table 3-2, below, and illustrated in Figure B-2 (*Appendix B - Wildlife*). Suitable habitat levels in the Dead Middleman, Rondeau Butte, and Salt Creek sites are currently below the take threshold established by the Service (USDI, USFWS 2007). The Rondeau Butte site is within 300 meters of proposed Unit 30-2-15A, as illustrated in Figure B-3 (*Appendix B - Wildlife*).

Table 3-2 Acres of spotted owl habitat types on BLM-managed land in affected home ranges and core areas.*

Site	Non-Habitat		Unsuitable		Dispersal Only		Suitable		Percent Suitable	
	Core	Home Range	Core	Home Range	Core	Home Range	Core	Home Range	Core	Home Range
DEAD MIDDLEMAN	3	24	289	1291	34	191	182	1407	36%	48%
DEADHEAD			132	882	5	103	366	1834	73%	62%
DEADMAN TRIB		5	187	767		146	315	1506	63%	51%
GRATEFUL DEAD			89	983	65	351	349	1561	70%	53%
RONDEAU BUTTE		14	66	455	153	581	70	272	14%	9%
SALT CREEK		47	46	226		33	194	580	39%	20%
TEXAS GULCH	3	10	140	448	1	24	357	1915	71%	65%

* “Percent Suitable” reflects private and BLM-managed acres within the core area and home range.

Woodrats (*Neotoma* ssp.) are the primary prey species for spotted owls in the South River Resource Area. Research has shown they account for 45 to 70 percent of the prey biomass consumed by spotted owls in southwest Oregon, particularly in drier forests such as those in the project area (Forsman et al. 1984, Carey et al. 1992, Forsman et al. 2004).

Other prey include northern flying squirrels (*Glaucomys sabrinus*, approximately 14 percent of prey biomass), Oregon red tree voles (*Arborimus longicaudus*,1 to 2 percent of prey biomass), brush rabbits (*Sylvilagus bachmani*, 6 to 22 percent of prey biomass), deer mice (*Peromyscus maniculatus*, about one percent of prey biomass), and Western red-backed voles (*Clethrionomys occidentalis*, 1 to 3 percent of prey biomass) (Forsman et al. 1984, Carey et al. 1992, Forsman et al. 2004).

Revisions to critical habitat for the northern spotted owl were designated by the U.S. Fish and Wildlife Service (Federal Register 2008a). It is defined as the habitat on which the physical and biological features essential to the conservation of the species are found. Critical habitat includes forest land that is currently unsuitable habitat, but has the capacity to become suitable habitat in the future. None of the proposed commercial thinning and density management units are located critical habitat.

As described on pages 6 and 7, portions of proposed Unit 30-2-15A are located within a Known Owl Activity Center (Rondeau Butte, P2203A).

2. BLM Bureau Sensitive Species

BLM Manual section 6840, states that Bureau actions must not contribute to the need to list BLM Special Status Species (SSS) under the Endangered Species Act. The Special Status Species list (http://www.or.blm.gov/isssp/) was last updated in January 2008 (USDI, BLM 2008a).

The **Chace sideband snail** (*Monadenia chaceana*) and **Oregon shoulderband snail** (*Helminthoglypta hertlieni*) are endemic to northwestern California and southwestern Oregon. They require adequate food sources, thought to be leaf litter, fungus, and/or detritus; as well as refugia from desiccation during dry periods. Refugia may include interstices in rock-on-rock habitat, soil fissures, or the interior of large woody debris (Weasma 1998*a*, Weasma 1998*b*, Frest and Johannes 2000). When active, these species can be found on herbaceous vegetation, ferns, leaf litter, or moss mats in moist, shaded areas near refugia. Where present, suitable habitat in the proposed commercial thinning and density management units will be surveyed using an accepted protocol (Duncan et al 2003). To date, a Chace sideband snail site has been located in Unit 30-2-15A.

The **Crater Lake tightcoil snail** (*Pristiloma articum crateris*) is a microsnail found at elevations above 2000 feet throughout the Oregon Cascades in perennially wet habitats such as springs, seeps, and wetlands. Specific habitat features used by the snail include large coarse woody debris, rocks, surface vegetation, moss, and uncompacted soil (Duncan et al. 2003). Potential tightcoil habitat is present in proposed commercial thinning and density management Units 30-2-3C, 30-2-9C, and 30-2-11A. The sites will be evaluated and, if warranted by habitat conditions, surveyed using an accepted protocol (Duncan et al 2003).

The **fringed myotis** (*Myotis thysanodes*) is an insectivorous bat species found throughout the western U.S. The species appears to utilize a range of habitats that includes Douglas-fir forest (reviewed in Verts and Carraway 1998). Known hibernacula and roost sites are known to include caves, mines, buildings, and large snags (Weller and Zabel 2001).

The **Pacific pallid bat** (*Antrozous pallidus pacificus*) is an insectivorous species also found in the Pacific Northwest. It generally uses arid or semi-arid environments with rock, brush, or forest edge habitat (reviewed in Verts and Carraway 1998). Known hibernacula and roost sites for the species include caves, mines, rock crevices, bridges, buildings, and hollow trees or snags (Lewis 1994).

The **Townsend's big-eared bat** (*Corynorhinus townsendii*) is also found in the western U.S. in habitats that include conifer forest (reviewed in Verts and Carraway 1998). Townsend's big-eared bat typically roosts and hibernates in mines and caves, but it has been found roosting in hollow trees as well (Fellers and Pierson 2002). Large remnant trees in the southeast corner of proposed Unit 29-2-33A could provide foraging and roosting opportunities for all three of these bat species.

B. Migratory Birds

Executive Order 13186, "Responsibilities of Federal Agencies to Protect Migratory Birds," directs agencies, including the BLM, to integrate bird conservation principles, measures, and practices into agency planning processes to restore and enhance habitat of migratory birds, as practicable, and ensure that environmental analysis considers effects of agency actions and plans on migratory birds, with emphasis on species of concern.

Guidance was issued in BLM Instruction Memorandum No. 2008-50, Migratory Bird Treaty Act – Interim Management Guidance (USDI, BLM 2008b). This memo identifies "Birds of Conservation Concern" and "Game Birds Below Desired Condition," as defined by the U.S. Fish and Wildlife Service (USDI, USFWS 2004), as species to be addressed in project-level NEPA documents.

Twenty-two bird species were identified from the "Birds of Conservation Concern" and "Game Birds Below Desired Condition" lists that are present on the Roseburg District. Five (harlequin duck, Lewis' woodpecker, marbled murrelet, peregrine falcon, and vesper sparrow) are addressed in Table B-1 (*Appendix B - Wildlife*). Habitat for 13 species (band-tailed pigeon, brown creeper, flammulated owl, northern harrier, olive-sided flycatcher, orange-crowned warbler, pacific-slope flycatcher, pileated woodpecker, red crossbill, rufous hummingbird, short-eared owl, wood duck, and Vaux's swift) would not be affected. The remaining four species that could be affected by the proposed action are discussed below.

Partners In Flight's *Conservation Strategy for Landbirds in Coniferous Forests of Western Oregon and Washington* (Altman 1999) provides information on the habitat attributes used by these species. Partners In Flight is an international coalition of government agencies, conservation groups, academic institutions, private organizations, and citizens dedicated to the long-term maintenance of healthy populations of native landbirds. Their conservation plan is one of many that may be used as guidelines by private and government organizations, including the BLM.

The **hermit warbler** forages in closed canopy stands with high foliage volume and would be expected to currently use the proposed commercial thinning and density management units. It is associated with stands of various ages that provide closed canopies with dense crowns. Other species associated with similar habitat attributes are the golden-crowned kinglet and chestnut-backed chickadee.

Mourning doves range across North and Central America, inhabiting a variety of habitats that include forest, desert, shrub/scrub, suburban areas and agricultural lands. Mourning doves forage in areas with little ground cover, and nest in edge habitats between forest/shrubs and open areas.

Wilson's warbler is an insectivorous species that uses deciduous shrub and subcanopy layers in a wide range of forest age classes. Although the proposed commercial thinning and density management units generally do not have a well-developed understory, they could provide some habitat for Wilson's warbler. Although primarily associated with forest stands, the species can also use early-seral shrub habitat. Other species associated with similar habitat attributes are the Swainson's thrush and warbling vireo.

The **winter wren** forages on the ground and low understory. It is most commonly found in older and more in structurally complex areas in the forest and is thought to fragmentation of interior habitat. It forages on shrubs, rootwads, down logs, ferns, and herbaceous vegetation. Another species associated with similar habitat attributes are the orange-crowned warbler. The proposed units are generally lacking in suitable structural complexity for this species.

III. Fisheries, Aquatic Habitat and Water Resources

All of the proposed commercial thinning and density management units are located within the Middle South Umpqua/Dumont Creek fifth-field watershed, and the following discussion is appropriately limited to conditions in this hydrologic unit.

The watershed has a Mediterranean type of climate characterized by cool, wet winters and hot, dry summers. Annual precipitation varies with elevation and averages approximately 40 inches a year within the project area. Most precipitation is in the form of rain; however some snow is likely at higher elevations in most years. Stream flow volumes closely follow the precipitation pattern. Peak stream flows occur between November and March, and low stream flows occur from July to October.

Streams located within the proposed units are generally first and second order headwater streams that are intermittent, and which typically have no surface flow during the dry season. The only perennial flowing stream within any of the proposed commercial thinning and density management units is a second order stream in Unit 30-2-15C. Downslope of the proposed units and along portions of the access route, are several larger perennial and fish-bearing streams. Aquatic habitat conditions and fish presence or absence were noted during site visits. Aquatic habitat conditions are summarized at the watershed scale.

A. Fish Species, Coho Critical Habitat, and Essential Fish Habitat

Salmonid species found in the Middle South Umpqua/Dumont Creek River Watershed include winter-run Oregon Coast steelhead trout and resident rainbow trout (*Oncorhynchus mykiss*), resident and sea-run Coastal cutthroat trout (*O. clarki clarki*), fall and spring Oregon Coast Chinook salmon (*O. tshawytscha*), and the Oregon Coast coho salmon (*O. kisutch*).

Federally-Threatened Species

On February 12, 2008, the National Marine Fisheries Service published a Notice of Intent proposing to list the Oregon Coast coho salmon as a threatened species under the Endangered Species Act (Federal Register 2008). The listing became effective on May 12, 2008. Critical habitat was designated concurrent with the ESA listing.

Coho salmon are present in the South Umpqua River and its tributaries near the project areas including Deadman Creek, East Fork Deadman Creek and Dompier Creek and other tributaries along the course of the river. Steep stream gradients and waterfall barriers prevent anadromous fish from ascending Deadman Creek and Dompier Creek within 1.5 miles of proposed units.

Bureau Sensitive Species

The Umpqua chub (*Oregonichthys kalawatseti*) is a Bureau Sensitive Species found predominantly in larger order streams and rivers throughout the Umpqua River Basin (Markle et al. 1991). Umpqua chub are present in the main-stem of South Umpqua River within the watershed.

Critical Habitat

As previously noted, critical habitat for Oregon Coast coho salmon was designated in the final Federal Register listing (Federal Register 2008b). Streams in the Middle South Umpqua/Dumont Creek watershed containing coho salmon are also designated as Critical Habitat. Streams designated at Critical Habitat near the project area include Dompier Creek, Deadman Creek and the South Umpqua River. Steep waterfalls and stream gradients limit coho salmon Critical Habitat to reaches greater than 1.5 miles downstream from the nearest unit.

Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act of 1996 (Federal Register 2002) designated Essential Fish Habitat for fish species of commercial importance. Essential Fish Habitat consists of streams and habitat currently or historically accessible to Chinook and coho salmon. Essential Fish Habitat for coho salmon in the watershed is coincident with coho salmon distribution and critical habitat.

B. Aquatic Habitat and Water Quality

Substrate/Sediment

Substrate condition

Availability of spawning substrate is important to fish productivity. Suitability of spawning habitat varies with the amount, size and quality of substrate. Gravel and small cobble substrate (Bell 1986) that is relatively free from embedded fine sediment is ideal spawning substrate for resident and anadromous salmonids.

In reaches where spawning size gravel is present, fine sediment can fill interstitial spaces within redds reducing oxygen flow to eggs or forming an armor preventing emergence of alevin (Waters 1995).

Riffles are considered in "desirable" condition when they contain less than 10 percent silt, sand and organic material (fines) and greater than 35 percent gravel (Foster et al. 2001). Aquatic Inventory surveys conducted by the Oregon Department of Fish and Wildlife in 1993 (USDI, BLM Appendix C 1997) indicated most stream reaches in the watershed had moderate amounts of gravel and some areas with high levels of sediment and embeddedness. Of 26 surveyed reaches, seven met the desirable criteria for the amount of fines in riffle units. Five reaches met the desirable criteria for the amount of gravel in riffle units.

More recent visual surveys in stream reaches in the project area indicate that availability of spawning substrate was moderate to high and embeddedness, though present, was not prevalent in many reaches. Overall, spawning habitat for salmonids was considered fair.

Sediment Sources

A multitude of activities related to timber harvest have the potential for cumulatively contributing sediment to streams within the surrounding watershed. Whether it is timber harvest, post harvest site preparation, forest road construction or forest road use, there is a potential for sediment to cause a decrease in water quality (Rashen et al. 2006).

Studies (Reid 1981; Reid and Dunne 1984) have shown that forest roads can be major contributors of additional fine sediment to streams. This additional sediment can reduce water quality for domestic use and can cause detrimental changes to streams and their inhabitants (Castro and Reckendorf 1995).

Roads may directly alter streams by increasing erosion and sedimentation, which in turn may alter channel morphology (Furniss, et al. 1991). Roads can act as a link between sediment sources and streams, and often account for most sediment problems in a watershed. Roads can be hydrologically connected to stream channels at roads crossings, where discharge is sufficient to create gullies in roadside ditches, and where fillslopes may encroach on streams.

In areas where operations are taking place on steep slopes there is an increasing risk in the acceleration of soil mass movements (Swanston 1974). When operations take place near live, flowing streams there is the risk of sediment reaching streams and affecting streams and stream inhabitants.

Large Woody Debris

Large woody debris plays an important role in stream morphology. Wood in headwater streams can store sediment and control channel morphology. Large wood is important in the formation of deep scour pools and the retention of gravel substrate (Bilby and Ward 1989). In higher order fish bearing streams, wood retains gravel substrate suitable for spawning and creates backwater and pool habitat during a range of stream flows (May and Gresswell 2003).

Wood can be delivered to streams by mass wasting and bank erosion, or from episodic events like landslides and blow-down (Hassan et al. 2005). Adjacent riparian stands and hill slopes in steeper, confined valleys astride headwater streams contribute greater amounts of large wood (Reeves et al. 2003). Absent large episodic debris flows, wood is retained in the stream for longer periods of time in headwater streams (May and Gresswell 2003).

Surveyed streams were generally lacking in large woody debris. Oregon Department of Fish and Wildlife considers reaches in desirable condition when they contain greater than 30 m^3 of large wood per 100 meters. Of the 26 surveyed reaches, seven met the desirable criteria for volume of large woody debris. The benchmark for the number of "key" pieces (pieces greater than 33 ft long and 24 inches in diameter) is three per 100 meters. There were no reaches that meet the desirable criteria for the number of key pieces (USDI, BLM Appendix C 1997).

High gradient headwater intermittent and perennial streams found adjacent to units generally had a higher volume and number of pieces of large woody debris than reaches surveyed by the Oregon Department of Fish and Wildlife. Habitat forming large woody debris pieces ranged from large logs greater than 24 inches in diameter to smaller hardwoods.

Pool Quality

Pools are important habitat features for juvenile rearing, both during low flow months when high stream temperatures add to stress and during high flow events when off-channel pools provide refuge habitat. Salmonids are generally found in greater densities (Roni 2002) and larger size (Rosenfeld et al. 2000) in deep pool habitats.

Oregon Department of Fish and Wildlife considers reaches in a desirable condition when they contain greater than 35 percent pool habitat by area and have greater than 2.5 complex pools (those having a large wood component) per kilometer. Of the 26 surveyed reaches, seven met the desirable criteria for pool area but there were no reaches that met the criteria for complex pools (USDI, BLM Appendix C 1997).

Habitat Access

Access to migrating fish can be restricted at stream crossings where culvert outlet jumps exceed six inches or the outlet pool depth is less than 1.5 times the height of the jump. Adult fish are capable of jumping in excess of four feet, but upstream migration by juvenile fish can be prevented by jumps in excess of six inches. Culverts sized to less than bank-full width or installed with gradients in excess of one-half percent can also limit fish passage by accelerating water velocities within the pipes (Watershed Professionals Network 1999).

Several culverts along Road No. 30-2-13.0 road are barriers to fish movement into tributaries of Deadman Creek. Other stream crossings in the watershed on both private and federal lands prevent movement of both juvenile and adult fish into tributaries.

Water Temperature

Water quality standards are determined for each water body by the Oregon Department of Environmental Quality (ODEQ). Water bodies that do not meet water quality standards are placed on the state's 303(d) list as Water Quality Limited (ODEQ 2008). The following streams located within the analysis area are identified as Water Quality Limited for temperature: Deadman Creek, Dompier Creek and the South Umpqua River. Although many streams within the analysis area are listed for exceeding state temperature standards, these are the only streams that are hydrologically connected to the proposed commercial thinning and density management units.

Water temperature is a key factor affecting growth and survival of aquatic organisms. Effects of stream temperatures on fish, amphibians, and macroinvertebrates vary by species and within the life cycle of a given species (Lantz 1971). Factors influencing water temperature include elevation, slope, aspect, local topography, stream flow patterns, channel geometry, vegetation, stream shading, and distance from headwaters.

The most common cause of elevated stream temperatures associated with timber harvest is a reduction in streamside shade that may cause stream surfaces to be more susceptible to solar radiation (Moore and Miner 1997). Currently, streams within or adjacent to the proposed commercial thinning and density management units were determined, by ocular estimates, to be well shaded with dense stands of conifers and hardwoods.

Peak Flows

Transient Snow Zone

In the analysis area the Transient Snow Zone lies between 2,000 and 5,000 feet in elevation and may alternately receive snow or rain during the winter months. Higher than normal peak flows can result from timber harvest in the Transient Snow Zone (Harr and Coffin, 1992). Harvest can create openings where snow accumulates more than it would in non harvested areas. Warm rain-on-snow events can melt this increased snow pack at a higher rate than normal which can cause an increase in the natural stream flow.

The present risk of peak flow enhancement resulting from past timber harvest was evaluated using a model recommended in the Oregon Watershed Assessment Manual (Watershed Professionals Network, 1999). The model predicts increases in peak flow based on the number of acres in a watershed located in the Transient Snow Zone and the percent of this area with less than 30 percent canopy closure.

Aerial photo interpretation and Geographic Information Systems (GIS) analysis of vegetative conditions in the sub-watersheds indicated that although past timber harvest and road construction has created openings within the canopy, over 90 percent of the forested lands in the Transient Snow Zone have canopy closures greater than 30 percent and the potential for peak flow enhancement from rain-on-snow events in these areas is low.

All of the approximately 290 acres proposed for commercial thinning and density management are located in the Transient Snow Zone. Table 3-2 summarizes the total forested acreage of each subwatershed in the Middle South Umpqua/Dumont Creek fifth-field watershed, the percentage of the forested acres in the Transient Snow Zone, the percentage of openings that currently exist in the Transient Snow Zone, and the threshold for increased risk of peak flows due to openings.

Table 3-3 Acres, Percent Area, and Percent Openings in the Transient Snow Zone*

Subwatershed (6th field)	Total Forest Acres	% Forested Acres in TSZ	% TSZ in Openings	Threshold for Increased Risk
South Umpqua River – Dompier Creek	9,320	58%	17%	55%
Deadman Creek	18,573	86%	9%	30%
Boulder Creek – Middle South Umpqua	23,317	92%	10%	25%
Dumont Creek	19,814	93%	8%	20%
Francis Facial Creek	12,710	64%	9%	50%
South Umpqua River – Ash Creek	14,073	80%	8%	35%
Summary for the entire Middle South Umpqua/Dumont Creek Watershed	97,807	82%	10%	35%

* Based on GIS analysis and aerial photo interpretation (GIS data from Healy et al. 2005).

Roads

Roads may modify hydrology through interception of precipitation by road surfaces and interception of subsurface flow. Intercepted subsurface flow is routed to ditch lines where it may enter streams in a more direct manner than via natural subsurface flow patterns. Once water is directed toward the stream through the ditch line the overall timing of water delivery is altered causing a peak in flow and an increase in drainage density throughout the watershed (Wemple and Jones 2003). In turn, this can decrease the volume of water that infiltrates into the ground for soil water storage (Furniss et al. 1991). This can result in higher peak flows in times of snow melt or rainfall and reduced stream flows in late summer. The magnitude of enhancement also depends on whether or not road segments drain directly into stream channels. Roads not connected to stream channels, or those with drainage that efficiently directs surface flow to the forest floor where it can infiltrate, would have a negligible effect on flow magnitude and timing.

Peak flows have been shown to increase substantially when roads occupy more than 12 percent of a watershed (Watershed Professionals Network 1999, IV-15). Roads occupy less than three percent of the Middle South Umpqua/Dumont Creek fifth-field watershed, and it is unlikely peak flows are being measurably affected by present road density in the project area.

C. Water Rights

Five registered surface water rights for domestic use exist within one mile downstream of proposed commercial thinning Unit 30-2-15D. The diversion points are located in the NW¼NW¼, Section 23, T. 30 S, R. 2 W.

IV. Botany

A. Vascular Plants, Lichens and Bryophytes

Based upon habitat conditions in the forest stands proposed for commercial thinning and density management, and previous surveys conducted in comparable forest habitat elsewhere in the South River Resource Area, there are three Special Status vascular plants whose presence would be considered a reasonable possibility. These are the Federally-threatened Kincaid's lupine (*Lupinus sulphureus ssp. kincaidii*), and Bureau Sensitive tall bugbane (*Cimicifuga elata*) and wayside aster (*Eucephalis vialis*).

Kincaid's lupine is an herbaceous perennial native to the prairies of the Willamette Valley and southwestern Washington. It has been found in forest openings, meadow gaps, and along forest edges in Douglas County, Oregon. (Menke and Kaye 2003)

Tall bugbane is a temperate herbaceous perennial found in wooded areas, primarily on north-facing aspects. It has been found on sites in the South River Resource Area in all stages of forest succession. A frequent association of the species with deciduous trees suggests that it may respond to gaps created in conifer forest (Kaye and Kirkland 1993).

Wayside aster is most commonly found in canopy gaps, on edges where forest and meadows meet, and in clearcuts (Gammon 1986). Wayside aster has been found in the South River Resource Area on sites in all stages of forest succession.

There are an additional 59 Special Status vascular plant, lichen and bryophyte species whose acknowledged range includes the Roseburg District (see *Appendix C – Botany*). Habitat for 16 of these species is not present in the analysis area. Habitat capable of supporting the remaining 43 species, including those discussed above, is present and was surveyed with negative results.

B. Fungi

There are 11 Bureau Sensitive fungi documented on the Roseburg District, consisting of *Cudonia monticola, Dermocybe humboldtensis, Gomphus kauffmanii, Leucogaster citrinus, Otidea smithii, Phaeocollybi californica, P. spadicea, P. olivacea, Ramaria largentii, R. spinulosa var. diminutiva,* and *Sowerbyella rhenana*.

Twelve additional species consisting of *Helvella crassitunicata*, *Phaeocollybi dissilens*, *P. gregaria*, *P. oregonensis*, *P. pseudofestiva*, *P. scatesiae*, *P. sipei*, *Pseudorhizina californica*, *Ramaria amyloidea*, *R. gelatiniaurantia*, *Rhizopogon chamaleontinus*, and *R. exiguus*, are suspected to be present on the Roseburg District based on habitat conditions and host species present.

These fungi are primarily associated with the Pinaceae family, principally Douglas-fir and western hemlock. Important habitat components include: dead wood; dead trees; live, mature trees; many shrub species; a broad range of microhabitats; and for many, a well-distributed network of late-seral forest with moist, shaded conditions.

Most Special Status fungi species are highly isolated in their occurrence. They produce short-lived, ephemeral sporocarps or fruiting structures that are seasonal and annually variable in occurrence (USDA and USDI 2007 p. 191). Richardson (1970) estimated that sampling every two weeks would fail to detect about 50 percent of macrofungal species fruiting in any given season. In another study (O'Dell 1999) less than ten percent of species were detected in each of two consecutive years at any one of eight sites. No Bureau Sensitive fungi have been identified in the Middle South Umpqua/Dumont Creek fifth-field watershed.

V. Soils

Most of the soils in the project area have developed from volcanic materials, including tuff and breccia, with smaller areas of andesite and basalt. Small inclusions of metamorphic rock, such as slate and quartzite, and sedimentary rock such as sandstone and siltstone are present in some of the proposed commercial thinning and density management units. (Johnson 2004, Walker 1991)

Tuff is primarily compacted volcanic ash, while breccia consists of compacted volcanic ash with larger particles of preformed, angular rock. Andesite and basalt have a small crystalline structure derived from extrusive molten rock.

The tuff and breccias have been deeply weathered, producing soils with moderate to high amounts of clay (clay loam to clay textures) and low amounts of rock. The topography is characterized by ancient, deep-seated slumps with benches and undulating topography. Also present are short slopes, such as old slump scarps, that are as steep as 70 to 85 percent, with shallow to moderately deep, gravelly soils (Johnson 2004, and Wert 1977).

When moist to wet, clay texture soils with low rock content found in the undulating topography have low soil strength. Concave slopes and depressions with water, such as sag ponds, moist swales and seeps have formed as a consequence of ancient slumps. Soils in these depressions tend to remain moist in the dry season because they are somewhat poorly-drained to poorly-drained, with seasonally high water tables. Consequently, these soils are also more subject to compaction by ground-based equipment. Vegetation in the wetter areas generally consists of sedges, grasses, and horse tails.

Some of these sag ponds, swales and seeps can be classified as wetlands, as they contain 1) hydric soils, 2) a predominance of wetland vegetation, and 3) wetland hydrology (USDA, Soil Conservation Service 1993; U.S. Army Corps of Engineers 1987). They are one-tenth of an acre in size or smaller, scattered in their occurrence, and not hydrologically connected.

Excepting tuff and breccias, other soils in the project area are generally low to moderate in clay content, with moderately hard to hard bedrock material. The slopes on these sites are from 50 to 75 percent with smooth, convex topography. Soil textures range from loams, to clay loams, with moderate to high amounts of gravel.

Soils within the proposed commercial thinning and density management units are rated stable to moderately stable by the Timber Production Capability Classification ratings. This was confirmed in field reconnaissance. Tension cracks from slow soil movement (creep) in earth flows are present in some of the units, but because of the slow rate of movement, forest management is feasible in these areas (USDI, BLM 1986).

All of the proposed units were cable or tractor yarded in the 1960s. Within the proposed commercial thinning and density management units, no major slope failures have occurred. Approximately six small slumps have occurred that may be characterized as shallow, three to five foot deep slough-outs. These range in size about 400 to 800 square feet in size, with travel distances of 200 feet or less. Three shallow cut slope failures have occurred resulting in soil sliding down onto road surface. These range in size from 26 to 75 feet in width and extend from 45 to 63 feet upslope from the roads. Most of these areas are currently revegetated with small to medium diameter conifers, or shrubs, ferns and forbs.

Proposed commercial thinning Unit 30-2-15D is located on a stable bench upslope from the ancient scarp face of the Dompier Creek slide. The southeast corner of the unit is close to the area of most recent movement in 1962. Small sections along the old scarp face are exhibiting slow soil movement indicated by tilting trees and stair-stepped, exposed soil scarps.

VI. Fuels Management/Fire Risk and Air Quality

Fuels Management/Fire Risk

Fine fuels are most susceptible to ignition and most responsible for rate of fire spread. These are referred to as 1-hour (< ¼-inch diameter), 10-hour (¼ to 1 inch in diameter) and 100-hour (1 to 3 inches in diameter) fuels. The hours correspond to the length of time it takes the moisture content of individual fuels to reach equilibrium with changes in relative humidity. Large fuels are those greater than 3 inches in diameter, and are typically described as 1000-hour or 10,000- hour fuels because of the lengthy time required to reach equilibrium with changes in relative humidity. They are most responsible for fire intensity, duration and difficulty of control.

Existing fuel conditions in the wildland urban interface units; 30-2-15A, 30-2-15C, and 30-2-15D are best described by descriptive code 1-MC-3 of *Photo Series for Quantifying Natural Residues in Common Vegetation Types of the Pacific Northwest* (Maxwell and Ward, 1980). Total fuel loading is estimated at 11.1 tons/acre, distributed as follows: 1-hour, 0.7 tons/acre; 10-hour, 1.1 tons/acre; 100-hour, 1.5 tons/acre; and large fuels, 7.8 tons/acre. Fuels cover approximately 55 percent of the unit surface area, to an average depth of approximately one inch.

The present risk for wildfire in the wildland urban interface of the project area is considered low to moderate based on existing fuels load, stand characteristics, and understory vegetation that could contribute to fire spread.

Air Quality

The Oregon Smoke Management Plan identified areas of air quality concern and established Designated Areas where smoke intrusion should be avoided. The only Designated Area in proximity to the proposed commercial thinning and density management units is Roseburg, Oregon, located more than 20 miles to the northwest.

VII. Cultural and Historical Resources

A cultural resource inventory of the nine proposed commercial thinning and density management units has been conducted. Four of the nine units under consideration (29-2-21A, 30-2-3A, 30-2-15A, and 30-2-15D) do not contain any known archaeological resources. The remaining five proposed units have recorded archaeological sites within them or sufficiently close to them to warrant further discussion.

Site 35DO635, located in proposed Unit 30-2-3B was evaluated in 1994. It was determined that it was not a site of significant[4] value. A datum was installed on the site and would be protected from logging activity.

Site 35DO363 is partially located in proposed Unit 29-2-33A, and on adjoining private lands. The portion of the site on BLM lands was evaluated in 1998 and determined not to be of significant value. A datum was installed on the site and would be protected from logging activity. The portion on private lands was not evaluated, but contained numerous surface artifacts that suggest it may contain significant deposits of cultural materials. Proposed harvest related actions on the private lands would have the potential for impacting the site. If avoidance were not possible, mitigation would be applied, after consultation with the State Historic Preservation Office. This could be in the form of extraction of a portion of the information contained within the site, or through the application of protective measures.

Site OR-10-275 in proposed Unit 30-2-9C has not been evaluated and would be avoided by placing a buffer around it approximately one acre in size.

Site 35DO448 is close to proposed Unit 30-2-11A. A 1994 evaluation determined the site was not significant. A datum was installed on the site but it is sufficiently distant from any proposed activity that it would not require protection.

Site OR-10-274 is close to proposed Unit 30-2-15C. The site has not been evaluated but the logging as proposed would not impact the site. The site and datum would be protected, however, by informing the contract administrator of its location so that any logging activities would be prohibited in the area.

[4] Significance refers to the value of the resource as defined in the National Historic Preservation Act and its implementing regulations, rather than effects as described in the National Environmental Policy Act and the implementing regulations of the Council on Environmental Quality.

VIII. Recreation Opportunities and Visual Resources

The areas proposed for commercial thinning and density management are interspersed with small, private holdings and industrial lands primarily managed for timber production. There are no developed recreational facilities or proposed developments in the timber sale areas.

Recreational use is limited to areas where public access is available over roads wholly under the control of the BLM. Recreational opportunities are of a dispersed nature, such as hiking, picnicking, wildlife observation, and hunting.

It is not anticipated that these pursuits would be precluded as opportunities are abundant throughout the Roseburg, Coos Bay and Medford Districts of the BLM, the Umpqua National Forest and Crater Lake National Park. Consequently, these recreational activities will not be discussed further in this assessment.

Off-highway vehicle use is "limited" to existing roads and designated trails. This was a decision made by the ROD/RMP (p. 58) that is beyond the scope of this environmental assessment to address. Other forms of off-highway vehicle use are not authorized and cannot be assessed as doing so would entirely speculative in nature.

The areas in which commercial thinning and density management are proposed are categorized as Visual Resource Management (VRM) Class IV. No specific visual management constraints are applicable to lands managed for VRM IV objectives (ROD/RMP, p. 53).

IX. Noxious Weeds and Invasive Non-Native Plants

There are scattered infestations of noxious weeds and non-native plants throughout the Middle South Umpqua/Dumont Creek fifth-field watershed. On BLM-managed lands and along many access roads the two most common are Himalayan blackberry and Scotch broom. As discussed in Chapter Two (p. 8), actions taken to contain, control and eradicate existing infestations are undertaken independent of timber management actions through implementation of the Roseburg District Integrated Weed Control Plan and Environmental Assessment (USDI, BLM 1995b). Activities include inventorying weed infestations, assessing risk for spread, and applying control measures in areas where management activities are planned. Control measures may include releasing biological agents, mowing, hand-pulling, and the use of approved herbicides. Noxious weed treatments would be undertaken regardless of whether or not the proposed action is implemented.

Management practices implemented in conjunction with the proposed timber management plan would focus on preventing introduction of new infestations or spread of existing ones.

As a consequence negligible changes in noxious weed populations would be expected under either alternative, and no further discussion is necessary in this analysis.

Chapter Four
ENVIRONMENTAL CONSEQUENCES

This chapter discusses specific resource values that may be affected by the alternatives being analyzed. It addresses the nature of short-term and long-term effects, including those that are direct, indirect and cumulative, that may result from implementation of the alternatives. The discussion is organized by individual resources, addressing the interaction of the effects of the proposed timber management plan with the current baseline conditions of this environment. It describes potential effects, how they might occur, and the incremental result of those effects, focusing on direct and indirect effects with a realistic potential for cumulative effects, rather than those of a negligible or discountable nature.

The Council on Environmental Quality (CEQ) provided guidance on June 24, 2005, as to the extent to which agencies of the Federal government are required to analyze the environmental effects of past actions when describing the cumulative environmental effect of a proposed action in accordance with Section 102 of the National Environmental Policy Act (NEPA). CEQ noted the "[e]nvironmental analysis required under NEPA is forward-looking," and "[r]eview of past actions is only required to the extent that this review informs agency decisionmaking regarding the proposed action." This is because a description of the current state of the environment inherently includes effects of past actions. Guidance further states that "[g]enerally, agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historic details of individual past actions."

The cumulative effects of the BLM timber management program as a whole in western Oregon have been described and analyzed in the Roseburg District PRMP/EIS and the FSEIS for the Northwest Forest Plan, incorporated herein by reference.

I. Timber/Vegetation

A. Alternative One – No Action

Under this alternative, the BLM would not conduct commercial thinning and density management in the Matrix stands described in this assessment. The stands would continue to develop as relatively homogeneous and even-aged stands, primarily single-storied and dominated by Douglas-fir. Forest canopies would remain fully closed. The percentage of live crown in individual trees is projected to recede below 30 percent over the next 10 to 20 years, as lower limbs are shaded out and die.

Diameter growth and crown expansion would continue to decline from competition among trees for water, nutrients, and sunlight. Height growth, which is less affected by stand density, would continue, but with little corresponding increase in diameter, trees would become unstable and more susceptible to wind damage (Wonn 2001, Wilson and Oliver 2000). Suppression mortality and potential stagnation of tree growth would increase as live crowns recede.

Reduced tree vigor results in slower-growing trees and would make trees less capable of adapting to disturbance and more susceptible to damage and mortality from endemic populations of insects and root diseases present in the stands.

For the purposes of illustrating changes in stand conditions over the next 20 years, proposed commercial thinning Unit 30-2-15D was modeled using Organon Forest Stand Growth and Yield Model, version 8.2. Table 4-1 provides a comparison of current and future conditions.

Table 4-1 Comparison of Current Stand Conditions with Conditions in 20 Years under Alternative One.

Year	Trees per Acre	Basal Area (Square feet/acre)	Quadratic mean Diameter (inches)	Relative Density (percent)	Canopy Closure (percent)
2008	236	190	12.1	61	138
2028	190	264	15.9	76	142

Proposed commercial thinning Unit 30-2-15D was also modeled to illustrate tree mortality in merchantable diameter classes and the associated loss in basal area, cubic foot volume, and board feet volume over the next 20 years. Table 4-2 illustrates the results.

Table 4-2 Tree Mortality and Volume Loss in 20 Years under Alternative One.

Diameter Class	Trees per Acre	Volume (cubic feet)	Volume (board feet)
6" - 8"	5.83	39.86	210.61
8" - 10"	8.91	106.27	504.42
10" - 12"	13.92	296.05	1414.69
12" - 14"	10.58	343.99	1750.91
14" - 16"	2.80	133.22	718.99
16" - 18"	0.81	47.36	260.52
18" - 20"	0.38	31.61	185.09
Totals	**~ 43**	**~998**	**~5,045**

This alternative would not meet the resource objectives for the General Forest Management Area and Connectivity/Diversity Block land use allocations described on page 2 of this assessment because it would not: provide a high level of quality wood and sustainable timber production from the General Forest Management Area; and moderately high levels of timber production from the Connectivity/Diversity Blocks; maintain stand health and vigor; and recover the commodity value of trees that would be lost to suppression mortality.

Stands in the Connectivity/Diversity Block and those portions of stands in Riparian Reserves in both the General Forest Management Area and Connectivity/Diversity Block would continue to develop along an even-aged, single-canopied trajectory**.** Species diversity would be reduced as competition among trees would gradually eliminate shade-intolerant species such as sugar pine and ponderosa pine, and some hardwoods including red alder. Shading from the closed canopy would also reduce understory and ground cover vegetation.

In the Connectivity/Diversity Block land use allocation, the object of developing ecotypic richness that includes trees of varying age and size, and stands with an assortment of canopy configurations would not be met. Stand development, and structural differentiation into multiple layers would occur slowly. Overall species richness and diversity would be delayed until a disturbance occurred that was sufficient to alter the present stand developmental pathways.

Two objectives of the Aquatic Conservation Strategy related to the management of Riparian Reserves are the maintenance and restoration of species composition and structural diversity of plant communities in riparian zones, and the maintenance and restoration of habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.

This alternative would not achieve these objectives because it would not: retain hardwoods as stand components; diversify the species and structural composition of riparian stands; and accelerate the growth of the remaining trees to provide short and long-term sources of large wood for instream recruitment. Tree growth would stagnate and stands would generally remain single-storied in structure, lacking large overstory trees. Species diversity would decline as shade intolerant hardwoods and conifers are suppressed and die out. The level of sunlight reaching the forest floor would be too low to support the establishment and growth of abundant understory vegetation.

B. Alternative Two – The Proposed Action

This alternative would meet the objectives set forth in Chapter One (p. 2).

Commercial thinning and density management in the Matrix allocations would meet the objective of assuring high levels of timber productivity and quality wood production by increasing average stand diameter growth. Increased rates of growth would be expected to last for 15 to 20 years, until forest canopies approach closure again. Selecting the best formed co-dominant and dominant trees for retention, and promoting live crown expansion, and heights and diameter growth by releasing these trees from competition would aid in maintenance of stand health and vigor, and increase resistance to disturbances such as wind, disease, insect attack, and wildfire.

Variable density thinning in the Connectivity/Diversity Block and Riparian Reserve land use allocations would create gaps and areas of greater canopy removal, allowing sufficient light for regeneration of more shade tolerant conifers, retention of hardwood species, and establishment of shrub and forbs communities on the forest floor. The lower stand densities in Riparian Reserves would accomplish these same objectives and allow for accelerated tree growth that would provide larger wood for future instream recruitment.

As illustrated in Table 4-3, the direct effects of commercial thinning and density management would be:

- A 45 to 60 percent reduction in present basal area;
- A reduction in relative density to between 0.28 and 0.35; and
- A reduction in canopy closure to between 54 and 75 percent.

Table 4-3 Summary of Post-Thinning Stand Conditions

Unit	Trees per Acre	Basal Area (Square feet/acre)	Quadratic Mean Diameter (inches)	Relative Density (percent)	Canopy Closure (percent)
29-2-21A (North)	94	110	14.7	33	66
29-2-21A (South)	89	120	15.7	35	65
29-2-33A	97	100	13.8	31	67
30-2-3A	60	100	17.3	28	54
30-2-3B	70	100	16.2	29	60
30-2-9C	86	110	15.1	32	65
30-2-11A	80	110	15.8	32	68
30-2-15A	95	110	14.6	33	68
30-2-15C	101	100	13.4	31	68
30-2-15D	95	110	14.6	33	73

As in analysis of Alternative One, changes in stand conditions over the next 20 years, following thinning, were modeled for proposed commercial thinning Unit 30-2-15D using Organon Forest Stand Growth and Yield Model, version 8.2. Table 4-4 provides a comparison of current and future conditions.

Table 4-4 Comparison of Current Stand Conditions with Conditions in 20 Years under Alternative Two

Year	Trees per Acre	Basal Area (Square feet/acre)	Quadratic mean Diameter (inches)	Relative Density (percent)	Canopy Closure (percent)
2008	95	110	14.6	33	73
2028	89	184	19.5	49	89

Proposed commercial thinning Unit 30-2-15D was also modeled, post-treatment, to illustrate tree mortality in merchantable diameter classes and the associated loss in basal area, cubic foot volume, and board feet volume over the next 20 years. Table 4-5 illustrates the recovery of approximately 3,500 board feet/acre that would otherwise be lost to suppression mortality under Alternative One.

Table 4-5 Tree Mortality and Volume Loss in 20 Years under Alternative Two*

Diameter Class	Trees per Acre	Volume (cubic feet)	Volume (board feet)
12" - 14"	1.63	49.49	248.56
14 - 16"	2.84	136.18	733.34
16" - 18"	0.68	39.13	214.87
18" - 20"	0.44	33.53	192.62
20" - 22"	0.25	27.19	165.17
Totals	**~ 6**	**~ 286**	**~ 1,555**

*Entries for diameter classes less than 12 inches do not exist because these trees would have been removed by thinning from below.

In the portion of proposed Unit 30-2-15A, located within the Rondeau Butte KOAC and managed as Late-Successional Reserves, light variable density thinning from below would remove smaller trees that that would normally die from suppression. This would limit recruitment of smaller diameter snags and down wood for the short term and reduce the overall numbers of trees available for snag recruitment and down wood over the longer term. The smaller diameter snags and down wood created by suppression mortality would not persist for the long term, however. Physical damage to existing down wood would also occur from felling and yarding operations.

In the short term, additional coarse woody debris and snags would be generated by: continuing suppression mortality in unthinned areas; non-merchantable wood left in the units following density management operations; mechanical damage to reserve trees, such as broken out tops; snow break and windfall; and snags felled for safety reasons. The portion of Unit 30-2-15A managed as Late-Successional Reserve would be evaluated post-treatment. If snags and coarse wood levels were deficient, residual trees would be felled or girdled to meet the required levels.

Over time, trees in treated areas of the stands would grow to larger diameters than trees in the untreated areas. The treated areas would eventually reach a level of stand density and canopy closure where mortality suppression would once again occur. This would result in snags and down wood of larger size, which would persist for longer periods of time. In light and moderately thinned areas the recommended five snags per acre larger than 20 inches diameter breast height would be achieved 10-20 years sooner than in areas not thinned.

Retention and release of hardwoods and minor conifer species, in conjunction with the protection of advanced regeneration in unthinned areas would contribute to development of multiple canopy layers, and species diversity. Canopy gaps created by endemic root disease would continue to contribute small-scale structural diversity in stands.

While the proposed commercial thinning and density management treatments would reduce tree densities in individual stands, it would not alter the seral stage of the stands, or the seral stage distribution of BLM-managed lands within the Middle South Umpqua/Dumont Creek fifth-field watershed. A tentative proposal for regeneration harvest in the watershed in 2010 has been formulated. The 198 acres of harvest proposed would reduce the present amount of late-seral forest managed by the BLM in the watershed by approximately 3.7 percent from the present level of 51.5 percent. Timber management in portions of the watershed managed by the Umpqua National Forest has been limited to commercial thinning and density management treatments, a trend that is expected to continue.

II. Wildlife

A. Alternative One – No Action

There would be no direct effects to wildlife on BLM-managed lands if the proposed commercial thinning and density management was not undertaken. Habitat conditions would remain generally unchanged at the unit scale in the short term unless a major disturbance such as fire, wind, ice, insects, or disease occurred. Otherwise, the primary influence on long-term habitat development would be the growth and mortality of overstory trees.

Conditions in proposed units would be most affected in the long term by competition mortality of overstory trees. Overstocked stand conditions would result in relatively slow growth rates that would prolong crown differentiation; eventually some trees would become dominant and shade out suppressed trees. These trees would stand as small-diameter snags and ultimately fall, but would not create openings as in late-seral stands because of their small size. The remaining dominant trees would soon expand their crowns into the newly-available growing space, limiting effects of mortality on understory vegetation. Multiple waves of such competition mortality would occur before dominant tree density would be low enough for understory reinitiation. This growth trajectory would be unfavorable to the development of mature and late-successional forest attributes, particularly large-diameter trees, high crown volume, large branches, cavities, large snags, and large woody debris.

Blowdown of small patches in mid-seral stands would be another, less important source of disturbance. Areas of root disease, soil instability, or poor tree height-to-diameter ratios would be susceptible to blowdown; such patches would increase light to the forest floor and stimulate remaining trees, shrubs, and herbaceous vegetation.

The availability of late-successional forest habitat is the primary wildlife concern in the Middle South Umpqua River/Dumont Creek fifth-field watershed because of the effects of past and expected future timber harvest. Forest stands in the watershed begin functioning as late-successional habitat at approximately 80 years old, when characteristics like large diameter trees, a secondary canopy layer, snags, and cavities have developed.

As described in Chapter three (p. 11), the South Umpqua River/Dompier Creek and Deadman Creek subwatersheds comprise an area of approximately 28,900 acres, approximately 27,950 acres of which is forested.

Approximately 10,420 forested acres are managed by the BLM, and another 9,585 acres by the Umpqua National Forest. In excess of 4,300 acres of BLM-managed lands are allocated as Riparian Reserves that currently function or are expected to function as late-seral forest habitat in the future. Overall, approximately 55 percent of the Federally-managed forest in the watershed is presently mature and late-seral forest, with future abundance on lands managed by the BLM and U.S. Forest Service expected to gradually increase over the next 50 years.

Private forest lands account for slightly less than 8,000 acres with about 587 acres of mature and late-seral forest or slightly more than seven percent of the privately-managed forest lands. The amount of late-seral habitat on privately-owned lands in the watershed is expected to steadily decline as these stands are expected to be managed on commercial rotations of 50 years or less.

For the northern spotted owl, private lands would cease to provide suitable habitat, and would only provide dispersal habitat in varying degrees of abundance and quality. Suitable nesting, roosting and foraging habitat would increase on Federally-managed lands to the benefit of owl pairs whose home ranges are dominated by Federal lands. Where a preponderance of ownership in spotted owl home ranges is private, long term viability would be uninsured as suitable habitat thresholds would likely be unachievable.

For Bureau sensitive mollusk species, the development of additional mature and late-seral forest on Federal lands would provide additional habitat. The absence of similar habitat on private lands could, where these private holdings are concentrated, result in population isolation.

Over the long term, bats would find additional roosting opportunities provided by additional mature and late-seral forest on Federal lands, while such opportunities would be largely absent on privately managed forest lands.

Early and mid-seral habitat is expected to be abundant on both BLM-managed and private land as a result of past and future timber harvest. Development and maintenance of ecologically useful early and mid-seral stands in areas of recent timber harvest is a growing concern, though. This is particularly true on private forest lands where the objective is often establishment and management of a Douglas-fir monoculture. Few large residual trees are left after harvest. Deciduous trees and minor conifer species are targeted for elimination through herbicide treatment and thinning.

Early and mid-seral stands on private forest lands not expected to provide high quality habitat for many of the spotted owl prey species found in the watershed, or for migratory bird species such as the winter wren and Wilson's warbler that utilize herbaceous vegetation, deciduous trees, shrub and mid-story canopy layers, or large residual trees and snags.

In general, forest age classes in the watershed will likely trend towards the extremes. Structurally simple stands with low plant species diversity will dominate private lands. Federally-managed lands will see increasing levels of late-seral stands with fewer acres of high-quality early and mid-seral stands.

B. Alternative Two – The Proposed Action

1. Special Status Species

a. Threatened and Endangered Species

The proposed commercial thinning and density management would affect approximately 290 acres of unsuitable and dispersal-only habitat in seven **spotted owl** home ranges (Table 4-4). Vertical and horizontal cover would be reduced in treated areas through overstory tree removal, with varying levels of residual tree density. Harvest would also damage existing shrub and herb layers, and may also damage or destroy some coarse woody debris and snags.

Spotted owls would be expected to continue to use these stands because post-project canopy closure would remain above 40 percent and the quadratic mean diameter of trees in the stands would exceed 11 inches, figures widely used as a threshold for dispersal function (Thomas et al. 1990). However, spotted owls would likely choose to utilize thinned stands less than unthinned stands until canopy cover returns to pre-project levels in approximately 10-20 years.

The proposed treatments would also aid in accelerating the development of habitat features used by both spotted owls and their prey, like large trees and snags, multiple canopy layers, herbaceous and shrub vegetation, and large woody debris.

The proposed commercial thinning and density management units are generally located at the periphery of the affected home ranges and would not limit access to suitable habitat for most affected sites (Figure B-2, *Appendix B – Wildlife*). The Rondeau Butte site would be most affected by the proposed commercial thinning and density management of approximately 44 acres in its core area and 181 acres in its home range (Table 4-4).

The Rondeau Butte site was last occupied in 2003, when a pair of non-reproducing spotted owls was present; but it has been unoccupied since. This site has only 14 percent suitable habitat in the core area and only nine percent across the entire home range, well below the 50 percent and 40 percent levels considered viability thresholds by the U.S. Fish and Wildlife Service.

The U.S. Fish and Wildlife Service has also determined that thinning within 300 meters of a spotted owl site will likely result in take. Approximately 12 acres of proposed Unit 30-2-15A is within 300 meters of the Rondeau Butte site, four acres of which would be left untreated to facilitate movement between habitat patches (Figure B-3, *Appendix B – Wildlife*).

The proposed thinning would temporarily reduce the quality of dispersal habitat in the site, but because there is little existing habitat and only sporadic occupation, it would not appreciably reduce the probability of spotted owl use of the site. Because unit 30-2-15A is within the Rondeau Butte KOAC, the marking prescription would apply features common to LSR density management. These would include the 'no treatment' area described above, a feathered edge closest to the nest patch, and an area of light thinning in the remainder of the unit (Figure B-4, *Appendix B – Wildlife*).

Spotted owl prey species would be affected by the proposed timber harvest. Species such as brush rabbits, woodrats, and other rodents are primarily associated with early- and mid-seral forest habitat (Maser et al. 1981, Sakai and Noon 1993, Carey et al. 1999) and could benefit in response to increased understory and shrub development. This could indirectly benefit spotted owls if increasing numbers of prey move into forest stands where they are available for capture.

Noise Disruption

No effect to spotted owls from noise disruption would be expected because all activities would meet the minimum disruption distance, as established by the US Fish and Wildlife Service (chainsaw: 65 yards, heavy equipment: 35 yards, helicopter: 120 yards), from any known spotted owl site or unsurveyed suitable habitat. Otherwise; operations would be seasonally restricted from March 1 to July 15. This would ensure that noise disruption would not cause spotted owls to abandon nests or fledge prematurely.

Table 4-6 Acres thinned in spotted owl home ranges and levels of suitable habitat in core areas and home ranges.*

Site Name	Total Federal Acres	Acres Thinning in Core	Core Percent Suitable	Acres Thinning in Home Range	Home Range Percent Suitable
Dead Middleman	2912		36%	32	48%
Deadhead	2819		73%	13	62%
Deadman Trib	2424		63%	13	51%
Grateful Dead	2895		70%	31	53%
Rondeau Butte	1322	44	14%	181	9%
Salt Creek	886		39%	13	20%
Texas Gulch	2397		71%	13	65%

*Acres are double-counted when they occur in multiple home ranges.

One future, proposed action has the potential to affect the Dead Middleman home range. Proposed regeneration harvest in the north end of the Middle South Umpqua/Dumont Creek watershed would remove an estimated 198 acres of mature forest. No suitable habitat would be removed from any of the northern spotted owl home ranges identified in this environmental assessment.

b. Bureau Sensitive Species

Where it occurs, suitable habitat for **Chace sideband, Oregon shoulderband and Crater Lake tightcoil snails** would be surveyed using an accepted protocol (Duncan et al 2003). Analysis of the number of sites found and available habitat in the project area would determine management strategy. If necessary, site protection may include altering unit configurations, designating buffers, or implementing other measures to provide suitable microclimate, undisturbed substrate, and vegetation or down wood to ensure that viable populations would remain in the occupied stands. Consequently, it would not be expected that the proposed commercial thinning and density management would contribute to the need to list these species under the Endangered Species Act. The proposed commercial thinning and density management could indirectly benefit these species by accelerating development of large woody debris and herbaceous vegetation.

Townsend's big-eared bats, Pacific pallid bats, and fringed myotis all are known to utilize caves, mines, or rock outcrops for roosts, maternity colonies, or hibernacula. None of these potential habitats exist in the proposed commercial thinning and density management units. Large remnant trees, present in the southeast corner of proposed Unit 29-2-33A, which could also be used by these species for roosting, would be reserved from harvest. The proposed commercial thinning and density management would not be expected to negatively impact these species, and could indirectly benefit these species by accelerating the development of large trees and future snags suitable for roosting, and by favoring insect populations through development of herbaceous and shrub vegetation.

2. Migratory Birds

The proposed commercial thinning and density management could have direct and indirect effects on migratory birds. Thinning would reduce canopy cover and volume, and remove or damage understory vegetation, snags, and coarse woody debris. Thinning would, however, also stimulate growth of retained trees, canopy stratification and the establishment and growth of shrubs and herbaceous vegetation.

Project design features for the proposed commercial thinning and density management that are intended, in part, to mitigate effects on migratory birds include: favoring a diverse residual tree species mix, retaining any large remnant trees, retaining snags where wherever feasible from operational and safety perspectives, retaining existing Decay Class 3, 4 and 5 coarse woody debris, and creating snags and coarse woody debris where needed in areas managed as Late-Successional Reserve.

Anticipated effects of commercial thinning and density management on the four bird species known to nest on the District are described below. Effects to individual birds, nests, and eggs cannot be evaluated and stated with certainty because unit-specific occupancy is unknown.

Thinning would modify and partially remove overstory, reducing foraging and nesting opportunities for the **hermit warbler** over the short term, until forest canopy closes in 10 to 20 years. The establishment of "no-harvest" buffers and retention of untreated clumps in Riparian Reserves would help to maintain habitat for this species, in the interim.

Commercial thinning and density management could affect **mourning doves** through the removal of suitable nest trees and reductions in future nesting opportunities. Nests, eggs, and/or nestlings could also be destroyed if units are harvested during the breeding season.

Nesting and foraging opportunities for **Wilson's warbler** would be reduced by commercial thinning and density management as overstory components are removed. Where present, secondary canopy layers and shrubs could also be damaged and/or removed resulting in decreased foraging opportunities. Establishment of "no-harvest" buffers and retention of untreated clumps in Riparian Reserves would help to maintain some level of useable habitat in the interim, though.

Commercial thinning and density management would reduce foraging opportunities for the **winter wren** by decreasing structural complexity near the forest floor as large down wood, shrubs, and understory trees are damaged or removed. The establishment of "no-harvest" buffers and retention of untreated clumps in Riparian Reserves may provide for continuity of use by the species and lessen the period of time over which the habitat redevelops suitability.

III. Fisheries, Aquatic Habitat and Water Resources

A. Alternative One – No Action

1. Fish Species, Coho Critical Habitat, and Essential Fish Habitat

Under this alternative, there would be no BLM authorized road construction, road renovation, road decommissioning, timber harvest and log hauling. Absent any of these activities, there would be no direct effects to aquatic habitat, anadromous or resident fish, or Essential Fish Habitat adjacent to or downstream of the proposed timber sale areas.

Fish species, including the threatened Oregon Coast coho salmon, and aquatic habitat that includes critical habitat and Essential Fish Habitat for coho salmon would continue to be indirectly affected by existing conditions and activities on private lands, though.

2. Aquatic Habitat and Water Quality

Spawning Substrate/Sediment

Absent the proposed commercial thinning and density management, there would be no road construction or renovation, or log hauling. Aquatic habitat would continue to be affected, however, by road runoff and sediment generated from roads with poor drainage, blocked cross drains, and inadequate rock surface. Over time these road segments would contribute additional sediment to stream channels impairing spawning substrate and rearing habitat.
Run-off from unsurfaced or poorly surfaced forest roads, particularly those heavily used during periods of wet weather will continue to contribute sediment to streams. Erosion and sediment from roads with inadequate or improperly functioning drainage will have a similar effect. Fine road sediment is generally quickly washed from larger streams (Bilby 1985); however, elevated inputs of sediment are likely to become embedded in stream substrates and impair function as spawning and rearing habitat.

Large Woody Debris

There would be no density management in Riparian Reserves. Overstocked stand conditions would continue to retard growth of large conifers and contribute to a trend of continued reduction in the amount large woody debris recruited into stream channels. This would lead to a gradual loss of pool habitat as existing wood decays and is flushed through the stream system which would, in turn, reduce the capacity of streams to store spawning gravel. This trend would continue for several decades until a natural disturbance reduced stand densities sufficiently to allow the growth of larger trees.

Where timber harvest occurs in riparian areas on private lands, losses of existing wood coupled with decreased recruitment of large wood into streams would limit replacement of existing complex pool habitat and creation of new pool habitat.

Pool Quality

Pool quality would remain generally unaffected in the near term. Existing pool habitat in streams adjacent to units would alternately develop and dissipate in the absence of large wood recruitment from adjacent stands. Smaller trees and logs that enter stream channels would provide temporary pool habitat and slow-water refugia, but it would generally not be deep and complex habitat and would not persist for long periods of time as the smaller wood deteriorates and is flushed through. This cycle would persist until trees of large size are available to streams allowing for development of more complex and longer persisting in-stream habitat.

Where timber harvest occurs in riparian areas on private lands, decreased recruitment of large wood into streams would limit replacement of existing complex pool habitat and creation of new pool habitat.

Temperature

Stream temperatures within the Middle South Umpqua/Dumont Creek fifth-field watershed are currently impacted by reduced streamside vegetation in valley bottom agricultural lands, meadows and reduction of riparian canopy closure on privately owned timber lands. These conditions would most likely persist and are unlikely to change.

Peak Flows

Transient Snow Zone

Timber harvest on privately owned lands within the TSZ of the Middle South Umpqua–Dumont Creek Watershed is likely to occur on an average rotation of 50 years. If harvest is undertaken on private lands in the same drainages, in the near future, short-term increases in peak flows could occur.

Roads

There would be no change in the length or location of the transportation system managed and maintained by the BLM, and consequently, no change in the potential contribution of existing roads to changes in peak flows.

3. Water Rights

Absent any timber harvest on BLM lands, there would be no effect on interception of precipitation or rates of evapotranspiration that could affect the water quality, rate or timing of water delivery to registered water rights downstream of the project area.

B. Alternative Two – The Proposed Action

1. Fish Species, Coho Salmon Critical Habitat, and Essential Fish Habitat

Direct effects to fish species from timber harvest and log hauling can result from the addition of fine sediment to streams resulting in a temporary increase in turbidity. Fine sediment that becomes embedded in spawning substrate can hinder survival of eggs and alevin still buried in gravel. Turbidity can reduce foraging ability, impair breathing by clogging gill membranes, and increase overall stress levels (Waters 1995).

No direct effects would be expected to any fish species inhabiting streams adjacent to or downstream of any of the proposed commercial thinning and density management units as described in the following discussion of effects on aquatic habitat and water quality.

Indirect effects from road construction and renovation, timber hauling and road decommissioning activities could include a reduction in spawning success and egg and alevin survival where fine sediments reach streams and accumulate in gravels. The application of project design features and Best Management Practices described below would arrest the mechanism for sediment transport or minimize the risk for delivery of fine sediment so that any effects would be expected to be short-term and so small as to not be measurable at the project level scale.

The following components were analyzed to assess potential effects of the proposed commercial thinning and density management activities on Essential Fish Habitat, with citations to appropriate sections of this assessment.

- *Water quality/Water quantity* – There would be no affect to water quality and/or quantity as a result of the proposed commercial thinning and density management. "No-harvest" buffers within Riparian Reserves would prevent delivery of sediment to streams and preserve streamside shading essential to the maintenance of water temperatures (Aquatic Habitat and Water Quality, pp. 41-43)
- *Substrate characteristics* – Timber hauling would have a small probability of contributing fine sediment to stream channels, especially at stream crossings. Road renovation and seasonal restrictions on hauling over roads with surfacing not suited to all-weather hauling would reduce the probability of sediment entering streams. Any affect to substrate as a result of sediment would be negligible and discountable magnitude (Aquatic Habitat and Water Quality, pp. 41-42).
- *Large woody debris within the channel and large woody debris source areas* – There would be no effect on existing in-stream large woody debris as it would be reserved and left on site. Density management in close proximity to streams would not affect short term recruitment of large woody debris. While density management would reduce the number of trees available for future recruitment, the trees that would be removed by density management would principally come from the suppressed and intermediate canopy layers. These smaller diameter trees would not persist over time. By applying density management and releasing the dominant and co-dominant trees in the areas adjacent to streams, accelerated growth would result and provide larger diameter trees for future recruitment as large wood (Aquatic Habitat and Water Quality, pp. 42-43).

- *Channel geometry* – Stream channels are stable and have riparian vegetation sufficient to prevent erosion caused by high stream flow. There would be no measurable increase in peak stream flows that would affect channel geometry (Aquatic Habitat and Water Quality, pp. 41 and 44-45).
- *Fish passage* – There would be no effect on fish passage as the proposed timber management plan would not include the construction or replacement of stream crossings on any fish-bearing streams where the potential for creating a barrier to fish passage would exist (Aquatic Habitat and Water Quality, p. 44).
- *Forage species (aquatic and terrestrial invertebrates)* – Forage for coho and Chinook salmon would remain unaffected. Streamside riparian vegetation, protected within Riparian Reserves and "no-harvest" buffers would continue to provide sources of terrestrial invertebrates. Aquatic invertebrate populations would be unaffected by discountable and negligible increases in sediment.

2. Aquatic Habitat and Water Quality

Activities that could affect aquatic habitat conditions could arise from three separate and distinct activities: road construction, renovation and decommissioning; timber harvest; and timber hauling.

Spawning substrate/sediment

Spawning substrate/sediment

Stream substrate would not likely be affected by the proposed commercial thinning and density management. Non-compacted forest soils in the Pacific Northwest have very high infiltration capacities and are not effective in transporting sediment overland by rain splash or sheet erosion (Dietrich et al. 1982). "No-harvest" buffers of 20 ft or greater would also provide root strength sufficient to maintain bank stability (FEMAT 1993), protect eroding banks and prevent additional sediment from entering streams and accumulating in gravel.

"No-harvest" buffer strips adjacent to headwater (less than 3rd order), intermittent and perennial streams would remain vegetated and non-compacted providing sufficient filtering capacity. Any sediment generated from thinning or density management activities would be intercepted by the vegetated strips soil and would not reach adjacent stream channels.

"No-harvest" buffers would be established on perennially wet areas, small wetlands, swales and sag ponds described on page 24. Absent any surface disturbance or removal of vegetation providing for soil cohesion, the risk of slope movement or failure would be low. If such an event were to occur it would be of low magnitude, as demonstrated by recent events, and would not travel a sufficient distance to affect streams or aquatic inhabitants.

The majority of potential effects from timber harvest on aquatic systems come from road related activities, which can contribute sediment to streams that can affect substrate for spawning (Furniss et al. 1991).

These activities would include a combination of road construction and renovation. All renovation to existing roads would occur outside of Riparian Reserves as would construction of four of the five temporary spurs proposed. In the case of the fifth proposed spur road, its location would be approximately 100 feet above the inception point of an intermittent stream. Vegetated slopes between the road and the stream would filter out sediment from ditch runoff before it reached streams.

Timber hauling would occur during both dry and wet seasons of operation. Haul during the dry season would neither generate nor deliver road-derived sediment to live stream channels, because absent any substantial precipitation, there would be no mechanism for moving fine sediment from the road surface into the ditch line and potentially into nearby stream channels. Additionally, absent surface flow, there would be no mechanism by which intermittent streams would transport sediment downstream to fish bearing reaches.

Hauling during the wet season, normally between October 15th and May 15th can contribute fine sediment to streams where roads cross the stream (Waters 1995). Intermittent stream channels along the haul route generally have steep gradients with high sediment storage capacity sufficient to retain any small amount of sediment generated in the local area (Montgomery and Buffington 1997). Most stream reaches also had large woody debris sufficient to trap and store sediment in headwater reaches well upstream of fish bearing reaches.

In order to further reduce the potential for sediment delivery, the following project design features and Best Management Practices could be implemented at the time of operation:

- Temporary road construction would be located on stable slopes or ridge-tops, and disconnected from the drainage network, thus preventing sediment delivery to live streams and intermittent channels;
- Temporary roads would be built, used and decommissioned during the same operating season so that there would be no increase in drainage density or potential for future erosion and delivery of fine sediment to streams;
- Stream crossings on principal haul roads would receive adequate rock resurfacing and cross-drain installation to remove sediment from the road. Cross drains would be located approximately 50 feet from crossings on steep approaches in order to prevent concentrated ditch drainage from entering live stream channels.
- Ditch lines would be left vegetated where possible to help capture and retain sediment from road runoff.
- Timber hauling would be suspended during or prior to forecast periods of substantial precipitation, or when sediment laden water appears in the ditchline.
- Water bars may be installed as needed to further route water off of the road surface and onto the forest floor.

Large woody debris

The removal of smaller suppressed and intermediate trees from areas near stream channels can have a short term effect on instream habitat, by reducing the short-term availability of wood for in-stream recruitment, as small woody material can create pool habitat in smaller stream systems (Bilby and Ward 1989).

However, smaller diameter wood does not persist in the stream channel for the long term due to higher rates of decay (Naiman et al. 2002) and is more easily flushed from the system than large pieces (Keim et al. 2002).

Most instream wood comes from within a site potential tree height from the channel (Naiman et al. 2002), although large wood can also come from distances greater than 90 meters from the channel in steeply confined channels (Reeves et al. 2003). In the long term, the availability of large trees for in-stream recruitment from areas close to streams would increase as density management would accelerate the growth and development of larger trees close to the stream channel.

Road renovation and construction would no affect on large wood contribution to streams. Smaller diameter trees that would be removed for the proposed road construction are well away from streams and not considered likely to contribute to large wood recruitment. Road renovation would not remove any large trees.

Pool quality

Large wood is an important pool habitat forming component for fish-bearing streams (Keim et al. 2002). Pool habitat availability would remain unaffected by thinning and density management activities over the short term as all existing large wood that presently contributes to the formation of pool habitat would be reserved.

Density management in proximity to streams would result in the removal of smaller trees from the suppressed and intermediate canopy layers, but would not reduce availability of larger trees for instream recruitment. Over a period of decades, density management would promote the accelerated growth of the remaining trees which, over time, would enter streams enhancing existing pool habitat and creating additional pool habitat.

There would be no change in pool availability resulting from road renovation, construction, and decommissioning as these activities would not affect existing pool-forming wood or impact the capacity of stands adjacent to streams to contribute large wood in the future.

Shade/Temperature

Shade from trees near the stream channel is important for reducing direct solar radiation and preventing increases in stream temperatures. Density management adjacent to riparian areas could potentially lead to increases in stream temperature by temporarily creating openings in the canopy and reducing streamside shade.

Variable width “no-harvest buffers” with a minimum of 20 feet in width on intermittent non-fish-bearing streams and 50 feet on perennial or fish-bearing streams would conserve the vegetation and streamside trees that provide primary shade for stream channels. Over time, the thinnings would promote the development of intermediate canopy layers and the growth of larger trees in areas adjacent to streams that would provide greater shade and long-term reductions riparian areas, resulting in a long term reduction in actual or potential solar heating.

Intermittent streams only carry water during winter months when cloud cover and shorter days limit the amount of solar heating. Buffer widths a minimum of 20 feet would preserve streamside trees providing primary shade that, in addition to topographical features of headwater streams, would result in negligible effects to temperatures in these streams.

On perennial fish-bearing streams, buffer widths in excess of 50 feet would continue to provide overhead canopy and stream side vegetation, limiting solar heating and increases in stream temperatures. Consequently, stream shading would not be affected by density management or commercial thinning and it is unlikely that stream temperatures would be measurably affected.

Habitat access

Access to spawning and rearing habitat would be unaffected by the proposed commercial thinning and density management or any of the associated road construction and renovation. There would be no culvert installations or replacements on fish-bearing streams near any of the units, and all proposed road construction would be on or near ridge tops and would not cross fish-bearing streams.

Peak Flows

Transient Snow Zone

Peak flow increases can occur in forested basins due to the creation of openings in the Transient Snow Zone caused by timber harvest and road construction. These effects primarily occur in areas with less than 30 percent canopy closure where snow may accumulate in openings and be subject to rapid melt from warm rain-on-snow events, creating higher than normal flows (Watershed Professionals Network 1999, IV-11). All 290 acres of the proposed commercial thinning and density management units are located within the Transient Snow Zone. Post-treatment canopy closure would remain between 55 and 75 percent, however, and there would be no expected potential for alteration of snow capture or snow melt that would give rise to an increased peak flow risk.

The only other action with the potential to decrease canopy closure would be the addition of approximately 0.9 miles of temporary roads which could result in the creation of an additional three to four acres of openings. These openings would have the potential for localized changes in snow capture, but the effects are thought to be negligible due to the fact that they would be scattered and would account for less than a 0.01 percent in openings in the Transient Snow Zone.

The overall changes in Transient Snow Zone openings that would result from implementation of Alternative Two are displayed below, in Table 4-7. These changes are not projected to cause any increase in the risk of higher peak flows.

Table 4-7 Comparison of Openings in the Transient Snow Zone under Alternatives One and Two.

Subwatershed (6th field)	Current Condition % TSZ in Openings	Alternative One % TSZ in Openings	Alternative Two % TSZ in Openings	Threshold for Increased Risk
South Umpqua River – Dompier Creek	17%	17%	17%	55%
Deadman Creek	9%	9%	9%	30%
Boulder Creek – Middle South Umpqua	10%	10%	10%	25%
Dumont Creek	8%	8%	10%	20%
Francis Facial Creek	9%	9%	9%	50%
South Umpqua River – Ash Creek	8%	8%	8%	35%
Summary for Middle South Umpqua – Dumont Creek Watershed (5th Field HUC)	**10%**	**10%**	**10%**	**35%**

Roads

The Middle South Umpqua/Dumont Creek Watershed is a Tier 1 Key Watershed. Management direction in the ROD/RMP (p. 20) calls for reducing existing road mileage within Key Watersheds. Since implementation of the ROD/RMP, road mileage in the watershed has been reduced by approximately 0.2 miles.

The proposed action includes 0.9 miles of temporary construction, all of it on stable slopes or ridge tops, and all of it disconnected from the drainage network, so that it would not concentrate run-off and contribute to potential increases in peak flows. Following the completion of commercial thinning and density management, the temporary roads and 0.9 miles of existing roads proposed for renovation, would be decommissioned. This would result in a slight, though largely imperceptible, decrease in overall road mileage within the Middle South Umpqua/Dumont Creek watershed, consistent with the objective of no increases in road density.

Peak flows have been shown to increase substantially when roads occupy more than twelve percent of the watershed (Watershed Professionals Network 1999, IV-15). Peak flows would not be measurably affected by the proposed road construction because the temporary roads would be decommissioned. Roads would continue to occupy only 2.2 percent of the watershed area.

Low Flows and Annual Yield

No measurable effect to stream flow would be anticipated as a result of commercial thinning or density management because it would involve only partial removal of vegetation on areas constituting three percent or less of each affected subwatershed.

In an overview of several studies, Satterlund and Adams (1992, p.253) found that water yield responses were less substantial when partial cutting systems removed a small portion of the cover at any one time. Where individual trees or small groups of trees are harvested, the remaining trees generally use any increased soil moisture that becomes available following timber harvest.

3. Water Rights

Surface water rights for domestic use located within one mile downstream of proposed commercial thinning Unit 30-2-15D would not be affected. As described above, there would be a negligible risk to increased peak flows from the proposed action. No effects from sediment or increases in water temperature would be expected. Consequently, there are no anticipated impacts to water quantity, timing or quality anticipated from the proposed commercial thinning and density management.

IV. Botany

A. Alternative One – No Action

1. Vascular Plants, Lichens and Bryophytes

In the absence of timber management there would be no direct effect to any populations Special Status vascular plants, lichens or bryophytes that may occupy the project area. Over time, however, species such as Kincaid's lupine and wayside aster would be indirectly affected because without timber harvest or other vegetation management to create and maintain gap and edge habitat, the availability of light would decline to a level insufficient to trigger flowering and reproduction.

2. Fungi

Absent timber management activities, there would be no modification of existing habitat conditions and the availability of host trees for ectomycorrhizal fungi would remain unchanged. Existing forest canopy would continue to provide shade and maintain cooler temperatures and higher humidity on the forest floor. Forest litter, soil organic matter and large woody debris would be undisturbed and continue to provide reservoirs of moisture and nutrients.

B. Alternative Two – The Proposed Action

1. Vascular Plants, Lichens and Bryophytes

There would be no direct effect to any Special Status vascular plants, lichens or bryophytes because, as documented in *Appendix C – Botany*, surveys were completed and no populations were found. No cumulative effects to any known populations would be anticipated as they are generally located in other watersheds and spatially separated from the project area by substantial distances.

2. Fungi

The proposed commercial thinning and density management would not affect any known sites for Bureau Sensitive fungi species described on page 23, as there are no known sites in the Middle South Umpqua/Dumont Creek fifth-field watershed.

Surveys for these 23 species are not considered practical for reasons discussed in Chapter Three on page 23, so their presence is unknown. If fungi are present in the proposed commercial thinning and density management units, loss of the sites could result as a consequence of the disturbance and removal of substrate, and microclimate modification, as described in the Final Supplemental Environmental Impact Statement to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines (USDA and USDI 2007 p. 37). Cumulatively, limited loss of individual fungi and habitat would not be expected to affect long-term viability and persistence of these species. As described in Chapter Three on page 23 most of these species are dependent on a well distributed network of late-seral forest with moist and shaded conditions, whereas the proposed action is the management of mid-seral forest stands.

V. Soils

A. Alternative One – No Action

There would be no direct effect on the soils in the project area. There would be no soil displacement or compaction associated with road and landing construction, and log yarding.

Soils on old skid trails and skid roads compacted by past ground based harvest, especially at depths exceeding six inches, would recover slowly as processes of freezing and thawing, the penetration of plant roots, and burrowing of small animals gradually break up compaction and incorporate organic matter into the soils (Amaranthus et al 1996; Powers et al 2005).

Absent wildfire, the duff layer and soil organic matter would continue to increase slowly as accumulations of needles, twigs and small branches, and larger woody material decompose.

B. Alternative Two – The Proposed Action

Soil displacement and compaction would result from construction of roads and landings, and yarding of timber. Reductions in soil productivity can be minimized by limiting the extent of soil disturbance and displacement, and the degree to which soils are compacted. Loss of soil organic matter and nutrients can be minimized by use of erosion control measures.

The impact of landings would be primarily limited to the road prism where yarding, log sorting and decking, loading, and hauling occur. On temporary roads and landings located on them, soil productivity would be decreased by displacement and compaction. Cable yarding operations would also result in some soil displacement immediately below landings.

Temporary spur roads and associated landings would be sub-soiled with several offset passes of tilling equipment to reduce compaction, and covered with logging slash to reduce the risk of erosion and unauthorized vehicular use.

Although it will not remedy soil displacement or bring about 100 percent recovery from soil compaction, tilling can bring about greater than 80 percent soil fracturing, and is an important step in recovery (Luce 1997). Tillage also helps prevent runoff and erosion by reducing compaction and increasing water infiltration.

The degree of soil disturbance caused by cable yarding varies with topography (convex vs. concave slope), slope steepness, angle of yarding with respect to the face of the slope (perpendicular vs. sideslope), and the number of logs yarded. Cable yarding generally produces localized areas of soil disturbance along the yarding corridors, with the greatest disturbance within 100 feet of the landing. Requiring a minimum of one-end log suspension reduces the degree of displacement and compaction in the yarding corridors. Requiring lateral yarding capability and location of landing at periodic intervals, as described on page 8 in Chapter Two, reduces areal extent of disturbance and compaction.

Monitoring of commercial thinning activities under similar site conditions has shown that cable yarding resulted in less than two percent soil disturbance, including landings areas. Excluding landings, generally less than one percent of the harvest area was affected. Effects in yarding corridors varied from little or no soil disturbance, to partial duff removal, to displacement of the top one to three inches of soil. Compaction was low to moderate, typically shallow, and concentrated in the center of the corridors. This is not considered sufficient to affect soil productivity.

For ground based harvest operations, the ROD/RMP (p. 131) specifies that landings, main skid trails, and large pile areas cumulatively affect less than approximately 10 percent of the ground based harvest area. This was further clarified in plan maintenance implemented since adoption of the ROD/RMP (USDI, BLM 2001, pg. 70).

Ground-based harvest in commercial thinning and density management operations would be conducted with harvester/forwarder equipment. Operations would be subject to standard Best Management Practices (ROD/RMP, p. 131) and project design features intended to reduce potential effects to soils associated with disturbance, displacement and compaction. Monitoring has shown that harvest with tractors, rubber tired skidders, shovel loaders, and harvester/forwarders affected three to nine percent of ground-based harvest areas, with the average less than six percent. This includes landings, major skid trails, and old trails that were re-used. The areal extent, amount of displacement, and depth of compaction was generally the least with harvester/forwarders.

Operations would be restricted to the dry season when soils are least susceptible to compaction. Harvester/forwarders would operate on top of limbs, tree tops, and other logging residues to minimize soil displacement and reduce ground pressure and potential compaction. Operations on designated trails and on slopes generally less that 35 percent would further reduce soil displacement. Pre-designation of trails would avoid tension cracks, areas of high water table particularly susceptible to compaction even in the dry season, and areas of rocky soils at greater risk for displacement. This would also minimize the area affected by trails. Forwarder trails would be mapped for treatment at a later entry, such as final harvest, if the need is identified.

Slope stability is not an overall concern. As discussed in Chapter Three (p. 25), past harvest resulted in some small slope failures with zero to short travel distances on the moderate to steep slopes.

Results of studies on the effects of timber harvesting on earthflow movement are varied. Swanston et al. (1988) found that clearcut logging directly on an active earthflow produced short-term, accelerated earth flow movement one year after the timber removal, but within three years all accelerated movement ceased and returned to pre-logging levels.

The authors concluded that the dominant effect of timber removal was the immediate loss of interception and evapotranspiration from the site. The increased soil moisture and ground water likely increased the movement of the earth flow. Keppeler et al. (1994) also found similar increases in soil moisture levels after clearcut harvesting.

Depending on the specific characteristics of the earth flow, Pyles et al. (1987) found that clearcut harvesting was not a factor in the movement of the studied earth flow, because of the high drainage capacity of the earth flow material.

No large changes in slope stability would be expected to result from commercial thinning and density management. Only a portion of the forest stand would be removed. Canopy closure would range from 55 to 75 percent, providing effective interception of precipitation. Growth rates of the 90 to 100 trees per acre remaining after thinning and density management would increase and elevated rates of evapotranspiration would capture most of the additional available water. On steeper slopes, the root mass of the remaining trees would help hold the soil mantle in place.

Commercial thinning of Unit 30-2-15D is not expected to have any effect on the Dompier Creek slide because the unit is located on a stable bench, and two potentially unstable areas along the southeastern edge of the stand, close to the 1962 slide scarp would be buffered out.

With the application of Best Management Practices and project design features described above, soil erosion would be limited and localized, and any reductions in soil productivity would be low. An estimated six percent of the acres designated for ground-based harvest and two percent of the acres designated for cable harvest would be subject to varying degrees of soil displacement and compaction. These effects would not extend beyond the immediate unit and spur road vicinities. These effects would not exceed the level and scope of effects considered and addressed in the PRMP/EIS (Chapter 4, pp. 12-16).

VI. Fuels Management/Fire Risk and Air Quality

A. Alternative One – No Action

Fuels Management/Fire Risk

Lightning has historically been the primary cause of wildfires, but wildfire occurrence has increased due to increases in dispersed recreation in forested settings, debris burning on private residences located within the Wildland/Urban Interface, and timber management activities on private and public lands.

Under this alternative, there would be no increase in fuel load on BLM-managed lands associated with timber harvest. For the short term, the fire risk associated with the subject forest stands would remain low to moderate. Over the long term, however, the fuel load would steadily increase, primarily as a consequence of increased mortality of suppressed trees in the stands.

The effects of suppression mortality were modeled in Organon Stand Growth and Yield Model, Version 8.2, Southwest Oregon. For stand 30-2-15A, a stand with a present fuel load estimated at 11 tons per acre, modeling indicates that, without density management, approximately 19 trees per acre greater than six inches diameter breast height would die over the next decade. An additional 16 trees per acre greater than six inches diameter breast height would die in the following decade.

The volume of accumulated bole wood that resulted from this additional mortality would be approximately 998 cubic feet acre. Air-dry Douglas-fir has a specific gravity of 0.48 (USDA 1974, p. 4-46) which is a density of approximately 30 pounds per cubic foot. This translates to an increase large fuel load, represented by bole wood, of 15 tons per acre, for a total of 26.2 tons per acre. The figure would be higher, however, because the model does not capture mortality in smaller diameter trees, or the volume of needles, limbs and portions of the tree that are below the minimum analytic diameter. Consequently, the actual fuel load could reach upwards of 35 tons per acre.

Private timber harvest would continue and would generate activity fuels that may elevate fire risk in the watershed. The extent is difficult to gauge, however, because there is no way to project the level of utilization or fuels treatments that would be practiced.

Air Quality

Absent any timber harvest, there would be no application of prescribed fire for and hazard reduction on BLM-managed lands, and consequently no effects to air quality. Prescribed burning may occur on private timber lands in conjunction with post-harvest site preparation. As such activities would be subject to State of Oregon smoke management restrictions, no long term degradation of air quality should occur.

B. Alternative Two – The Proposed Action

Fuels Management/Fire Risk

Short-term increases in fire risk in the proposed commercial thinning units in the wildland urban interface (30-2-15A, C, and D) would exist associated with increases in dead woody fuels. Fuel loads would be an estimated 14.9 tons of woody residue per acre compared to a current fuel loading estimated at 11.9 tons/acre. These conditions are best represented by photograph 2-DF-3-PC from *Photo Series for Quantifying Forest Residues in the Coastal Douglas-Fir – Hemlock Type* (Maxwell and Ward, 1976).

Fine fuels less than 3 inches in diameter would total approximately 4.1 tons/acre or one-third of the total fuel load, with fuels 3.1 to 9 inches in diameter accounting for an additional 10.8 tons/acre.

These figures are approximations as the actual tonnage of down wood greater than 9 inches in diameter would be influenced by defect and recovery, harvest methods, and market conditions that could influence log utilization. Existing large down wood greater than 16 inches in diameter and 16 feet or longer, reserved under contract provisions, would add another 3 to 5 tons per acres.

The increase in fine fuels created by the proposed commercial thinning and density management treatments would result in a small, short term increase in fire. These fine fuels would naturally degrade and decay in a matter of a few years, however, reducing the fire risk over time.

As described in the PRMP/EIS (Chapter 4-97 & 98), due to the fragmented ownership pattern that is typical in the project areas and common throughout the South River Resource Area, wildfire potential is not dependent on BLM management activities alone. The majority of large, stand replacing wildfires have involved multiple ownerships and were either started in or intensified by untreated activity fuels. Fire intensity and severity has also increased by the exclusion of fires from fire-dependent ecosystems allowing for an unnatural buildup of naturally occurring fuels.

The primary factors that could increase relative wildfire risk would be increased fuel loading created by timber management and silvicultural stand treatments, and an unnatural build up of fuels arising from fire suppression. Various types of fuels management would reduce this risk. Thinning, brushing and pruning early in early-seral stages would also facilitate hazard mitigation by reducing bulk crown density, altering the spatial arrangement of fuels, and removing ladder fuels.

Air Quality

State of Oregon smoke management restrictions limit or prohibit burning during periods of stable atmospheric conditions when residual smoke from previously burned units may become trapped by a surface inversion. Where surface inversions develop within 24 hours of unit ignitions, aggressive mop-up would be conducted to minimize the potential for residual smoke affecting the local airshed.

Where hand piling and burning is proposed for hazard reduction and/or site preparation, piles would be burned in the autumn or winter months during unstable fall and winter weather conditions when winds and atmospheric instability favor rapid smoke dispersion, and precipitation washes particulates from the air. Potential impacts to air quality within one-quarter to one mile of units would persist for 1 to 3 days and would be characterized by some haziness.

With the application of Oregon smoke management restriction, previously discussed, prescribed burning would not have cumulative and long-term effects to local air quality.

VII. Monitoring

Monitoring of the effects of the proposed action, if implemented, would be done in accordance with provisions contained in the ROD/RMP, Appendix I (p. 84-86 and 190-199), focusing on the effects of timber harvest on: Riparian Reserves; Late-Successional Reserves; Matrix; Air Quality; Water and Soils; Wildlife Habitat; Fish Habitat; and Special Status Species Habitat.

Chapter Five
List of Agencies and Individuals Contacted, Preparers, and Literature Cited

A notice of initiation of the analysis was published in the Winter 2007 Quarterly Planning Update. Upon completion and release of the EA, a Notice of Availability for public review and comment will be published in *The News-Review*, Roseburg, Oregon.

I. Agencies & Persons Contacted:

Adjacent Landowners & Down-stream Water Users
Cow Creek Band of Umpqua Tribe of Indians
National Marine Fisheries Service
U.S. Fish and Wildlife Service

II. The following agencies, organizations, and individuals will be notified of the completion of the EA:

Cascadia Wildlands Project
Douglas Timber Operators, Robert Ragon - Executive Director
Gene and Elaine Hicks
Klamath Siskiyou Wildlands Center
National Marine Fisheries Service
Oregon Department of Environmental Quality
Oregon Department of Fish and Wildlife
Oregon Wild
Pacific Northwest 4-Wheel Drive Association
U.S. Fish and Wildlife Service
Umpqua Valley Audubon Society
Umpqua Watersheds, Inc.
Ronald S. Yockim, Attorney-at-Law

III. List of Preparers:

Macrina Lesniak	Forester/Project Leader
Paul Ausbeck	Environmental Coordinator and Writer/Editor
Chris Langdon	Wildlife Biologist
Susan Johnson and Ryan Johnson	Silviculture
Keith Karoglanian	Hydrologist
Cory Sipher	Fisheries Biologist
Ward Fong	Soils
Terry King	Engineering
Gary Basham	Botanist
Isaac Barner	Archaeologist
Krisann Kosel	Fire Ecologist
Jay Besson	Management Representative

Literature and References Cited

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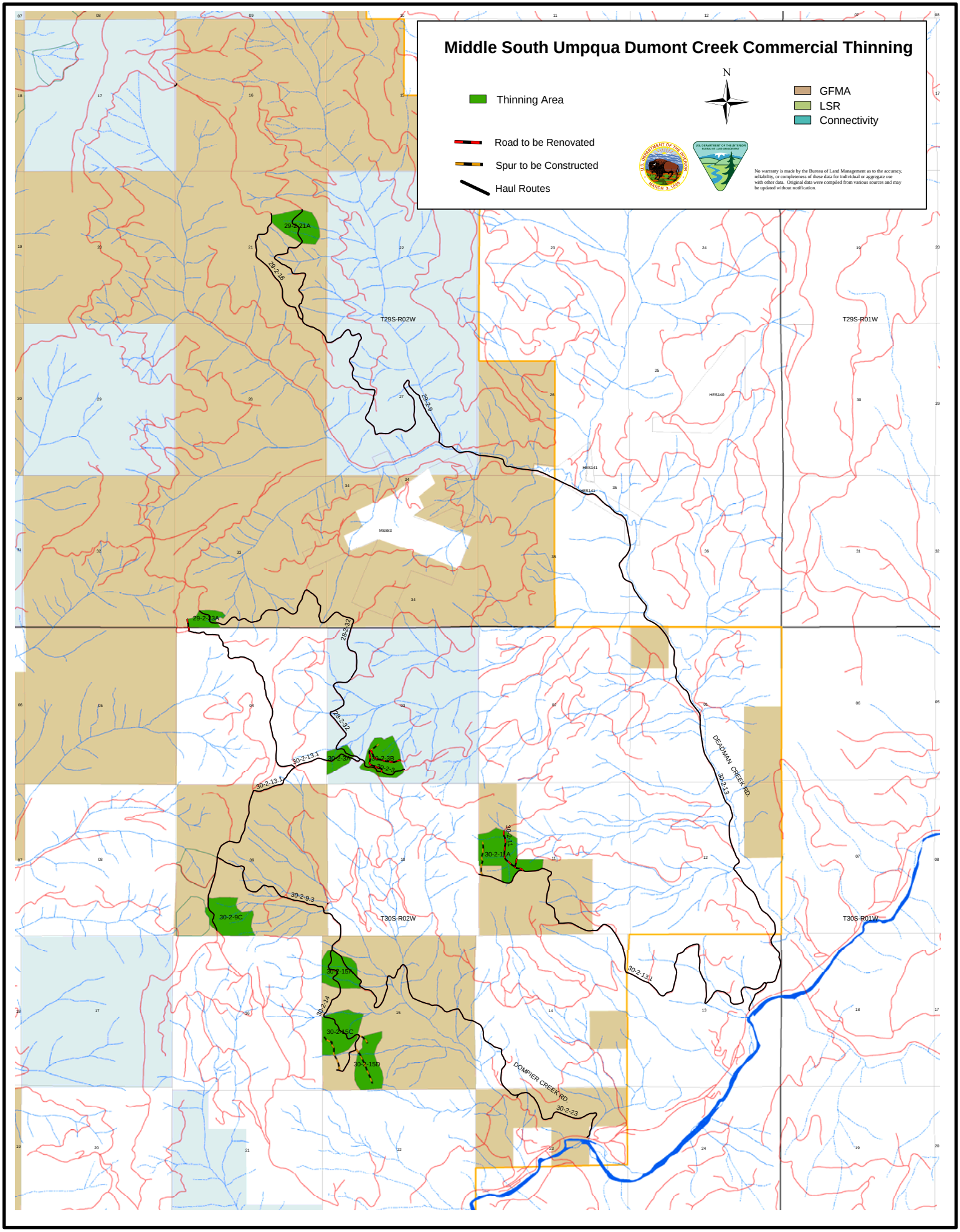
Appendix A - Vicinity Maps and Maps of the Proposed Timber Management Units


Middle South Umpqua Dumont Creek Commercial Thinning
Thinning Area
Road to be Renovated
Spur to be Constructed
Haul Routes
N
GFMA
LSR
Connectivity
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.
29-2-21A
29-2-18
T29S-R02W
T29S-R01W
29-2-9
HES140
HES141
MS883
29-2-33A
29-2-32
30-2-32
30-2-3A
30-2-3B
30-2-3
30-2-13.1
30-2-13
DEADMAN CREEK RD.
30-2-11
30-2-11A
30-2-9.3
30-2-9C
T30S-R02W
T30S-R01W
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DOMPIER CREEK RD.
30-2-23
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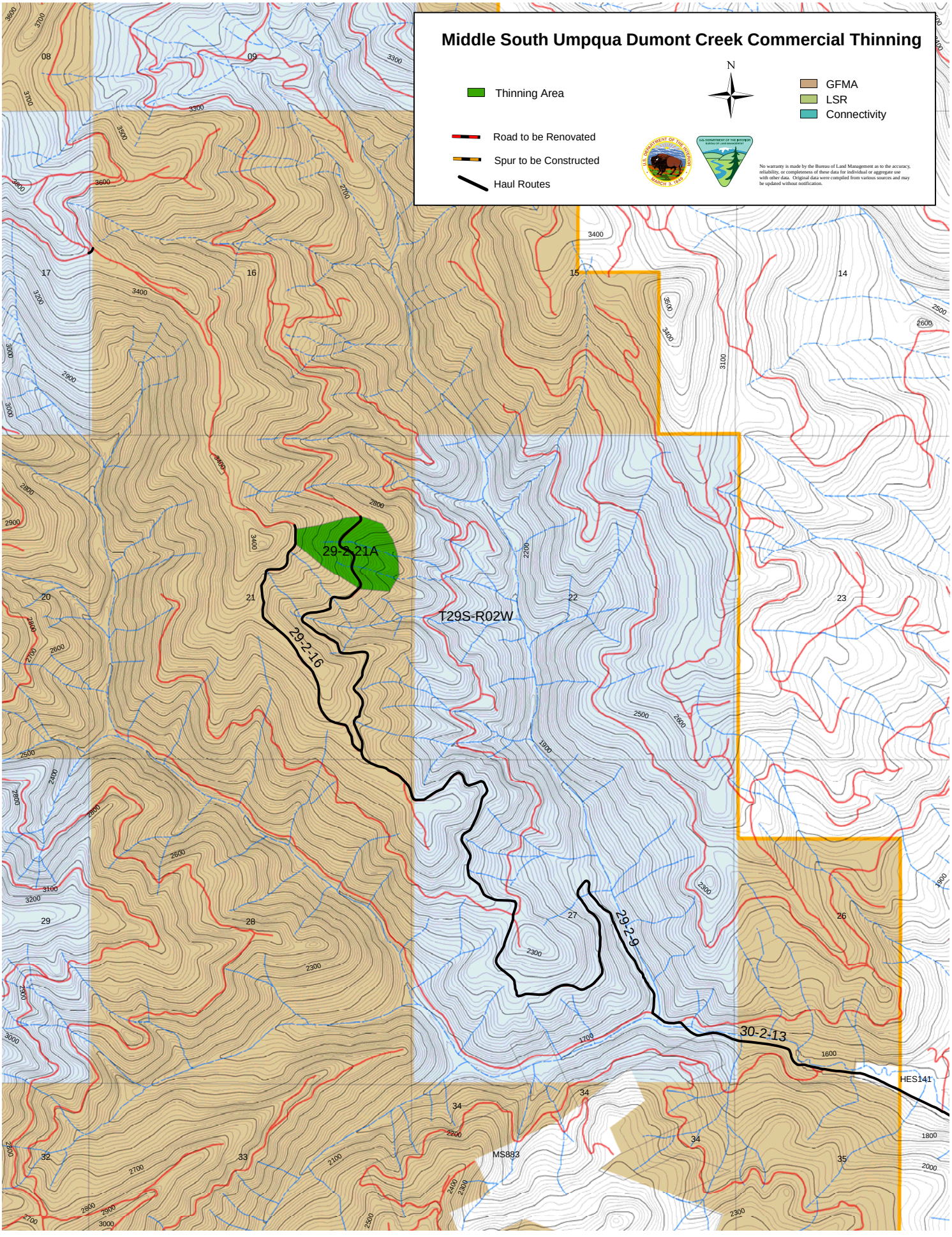
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Thinning Area
Road to be Renovated
Spur to be Constructed
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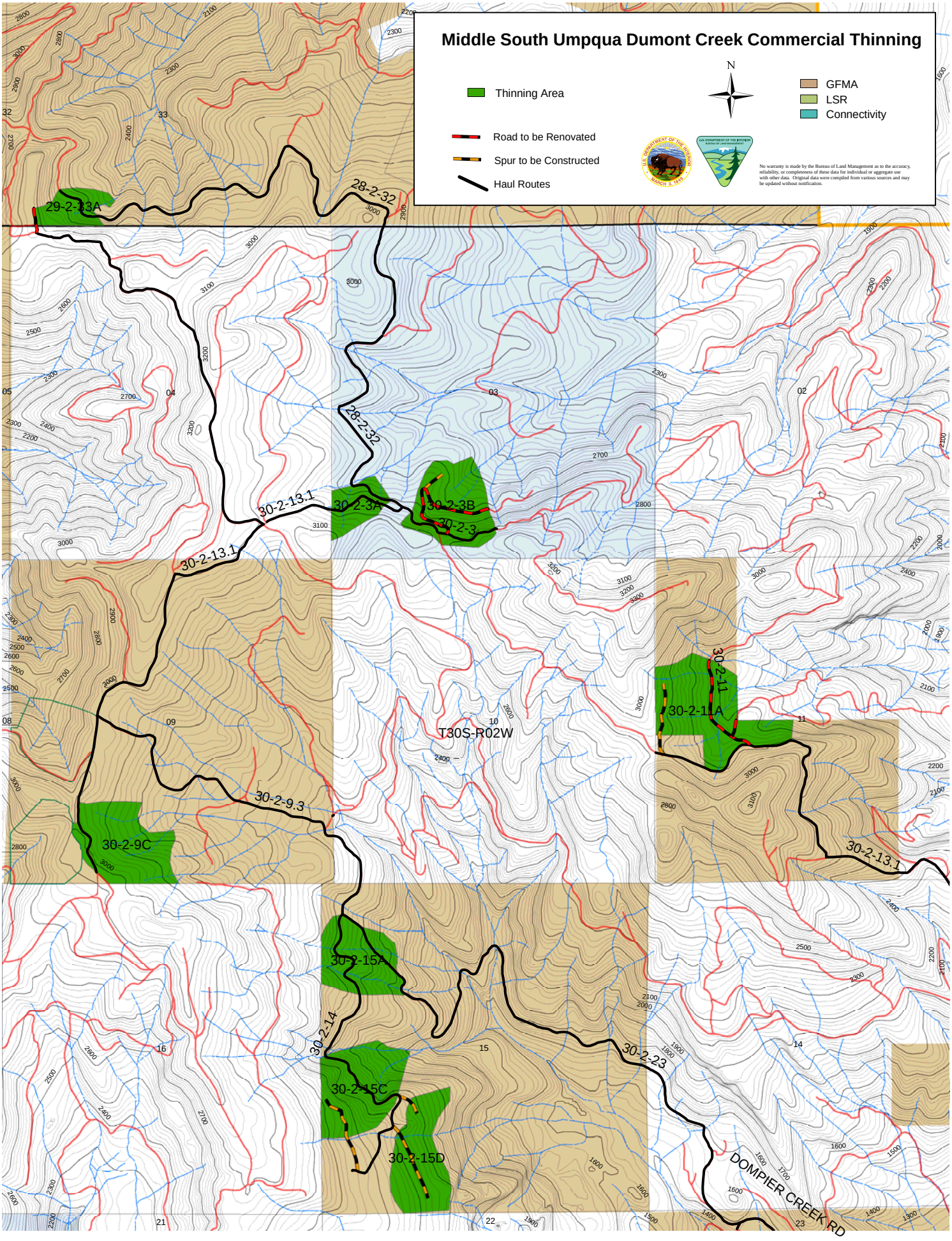
Middle South Umpqua Dumont Creek Commercial Thinning
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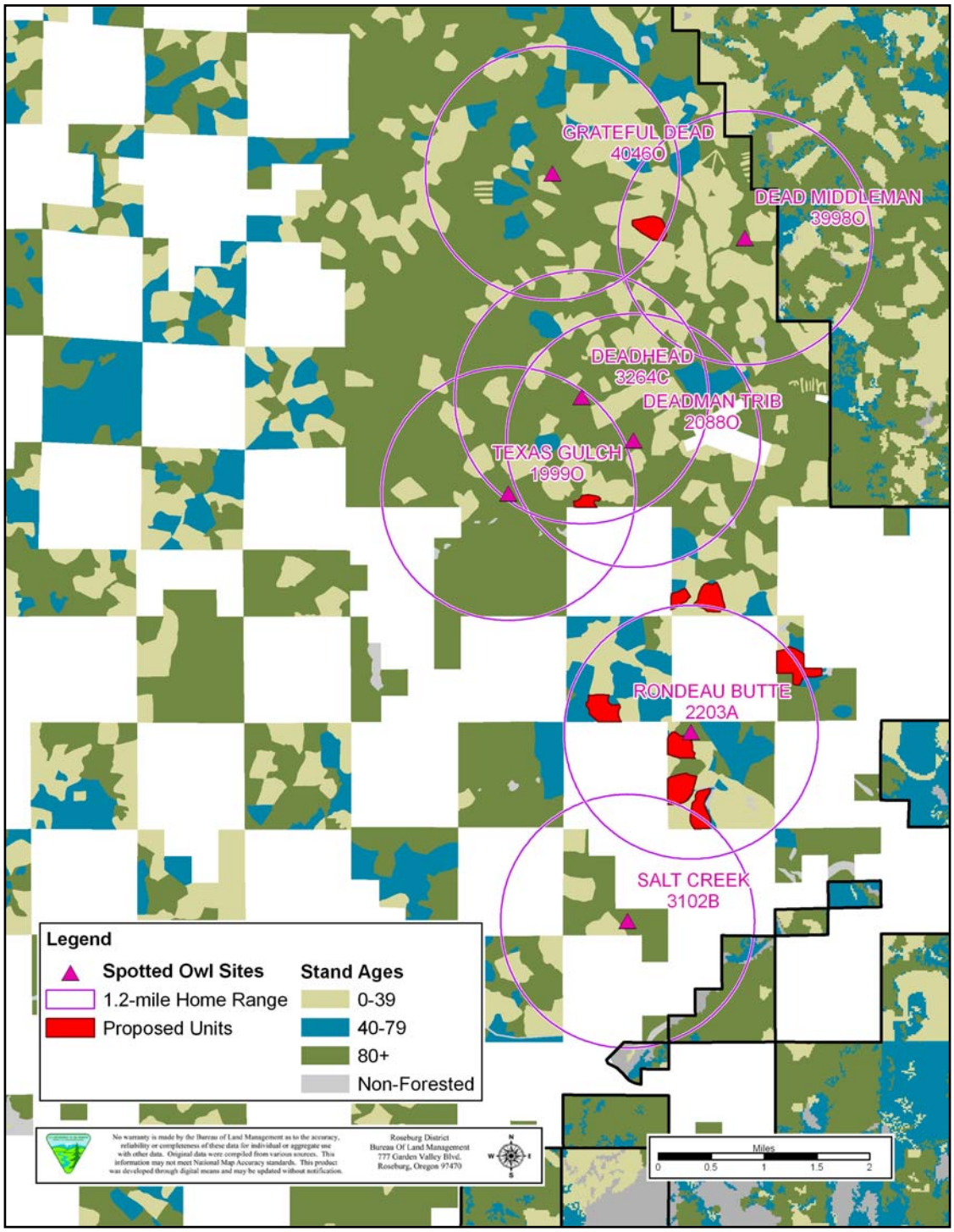
Thinning Area
Road to be Renovated
Spur to be Constructed
Haul Routes
GFMA
LSR
Connectivity
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.
29-2-33A
28-2-32
30-2-13.1
30-2-3A
30-2-3B
30-2-3
30-2-11
30-2-11A
30-2-9C
30-2-9.3
30-2-15A
30-2-14
30-2-15C
30-2-15D
30-2-23
T30S-R02W
DOMPIER CREEK RD
Scale: 1" = 24000
0
2 Miles

Appendix B – Wildlife

Table B-1. Special status wildlife species eliminated from further consideration

Status	Common Name	Scientific Name	Habitat Features Used	Reason if Eliminated
Federal Threatened	Marbled Murrelet	*Brachyramphus marmoratus*	Large diameter trees with nesting platforms within 50 miles of coast.	Out of species' range
Bureau Sensitive	American Peregrine Falcon	*Falco peregrinus*	Cliffs or other sheer vertical structure, generally in open habitat near water (White et al. 2002)	No Habitat
Bureau Sensitive	Bald Eagle	*Haliaeetus leucocephalus*	Large trees near large bodies of water (Buehler 2000, Isaacs and Anthony 2003)	No Habitat
Bureau Sensitive	Columbian White-Tailed Deer	*Odocoileus virginianus leucurus*	Oak woodland	No Habitat
Bureau Sensitive (Suspected)	Fisher	*Martes pennanti*	Large contiguous blocks of mature forest with structural complexity (Verts and Carraway 1998)	No Habitat
Bureau Sensitive	Foothill Yellow-Legged Frog	*Rana boylii*	Low-gradient streams with bedrock or gravel substrate (Corkran and Thoms 1996)	No Habitat
Bureau Sensitive	Green Sideband	*Monadenia fidelis beryllica*	Deciduous trees and brush in wet forest, low elevation; strong riparian associate (USDA/USDI 1994, Frest and Johannes 2000)	Out of species' range
Bureau Sensitive	Harlequin Duck	*Histrionicus histrionicus*	Larger fast-flowing streams and riparian areas (Thompson et al. 1993, Robertson and Goudie 1999)	No Habitat
Bureau Sensitive	Lewis' Woodpecker	*Melanerpes lewis*	Open woodlands with ground cover and snags (Tobalske 1997)	No Habitat
Bureau Sensitive	Northwestern Pond Turtle	*Actinemys marmorata marmorata*	Marshes, ponds, lakes, streams, and rivers with emergent structure (Csuti et al. 1997).	No Habitat
Bureau Sensitive	Oregon Vesper Sparrow	*Pooecetes gramineus affinis*	Grassland, farmland, sage. Dry, open habitat with moderate herb and shrub cover (Jones and Cornely 2002)	No Habitat
Bureau Sensitive	Purple Martin	*Progne subis*	Snags, woodpecker cavities; typically found in open areas near water (Brown 1997, Horvath 2003).	No Habitat
Bureau Sensitive	Rotund Lanx	*Lanx subrotunda*	Umpqua River and major tributaries (USDA/USDI 1994)	No Habitat
Bureau Sensitive (Suspected)	Scott's Apatanian Caddisfly	*Allomyia scotti*	Low-gradient streams with gravel and cobble substrates (Wiggins 1977)	Protected by Riparian Reserves if present
Bureau Sensitive (Suspected)	Spotted Tail-Dropper	*Prophysaon vanattae pardalis*	Moist mature forest (Frest and Johannes 2000)	Out of species' range
Bureau Sensitive	Western Ridged Mussel	*Gonidea angulata*	Low to mid-elevation streams with cobble, gravel, or mud substrates (Nedeau et al.	No Habitat
Bureau Sensitive	White-Tailed Kite	*Elanus leucurus*	Low-elevation grassland, farmland or savannah and nearby riparian areas (Dunk 1995)	No Habitat

Figure B-1. Affected spotted owl sites and proposed units.



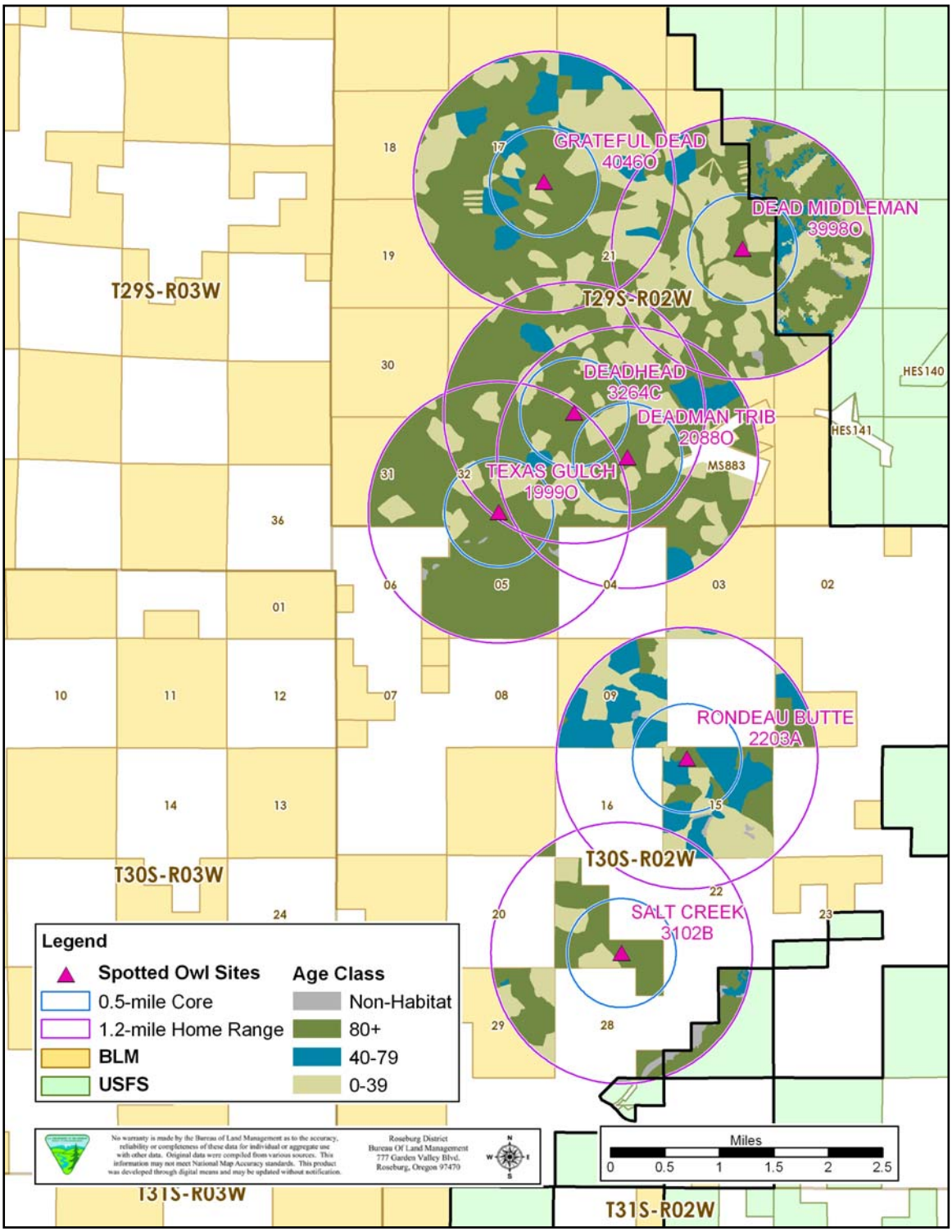


Figure B-2. Current forest ages in affected spotted owl cores and home ranges.

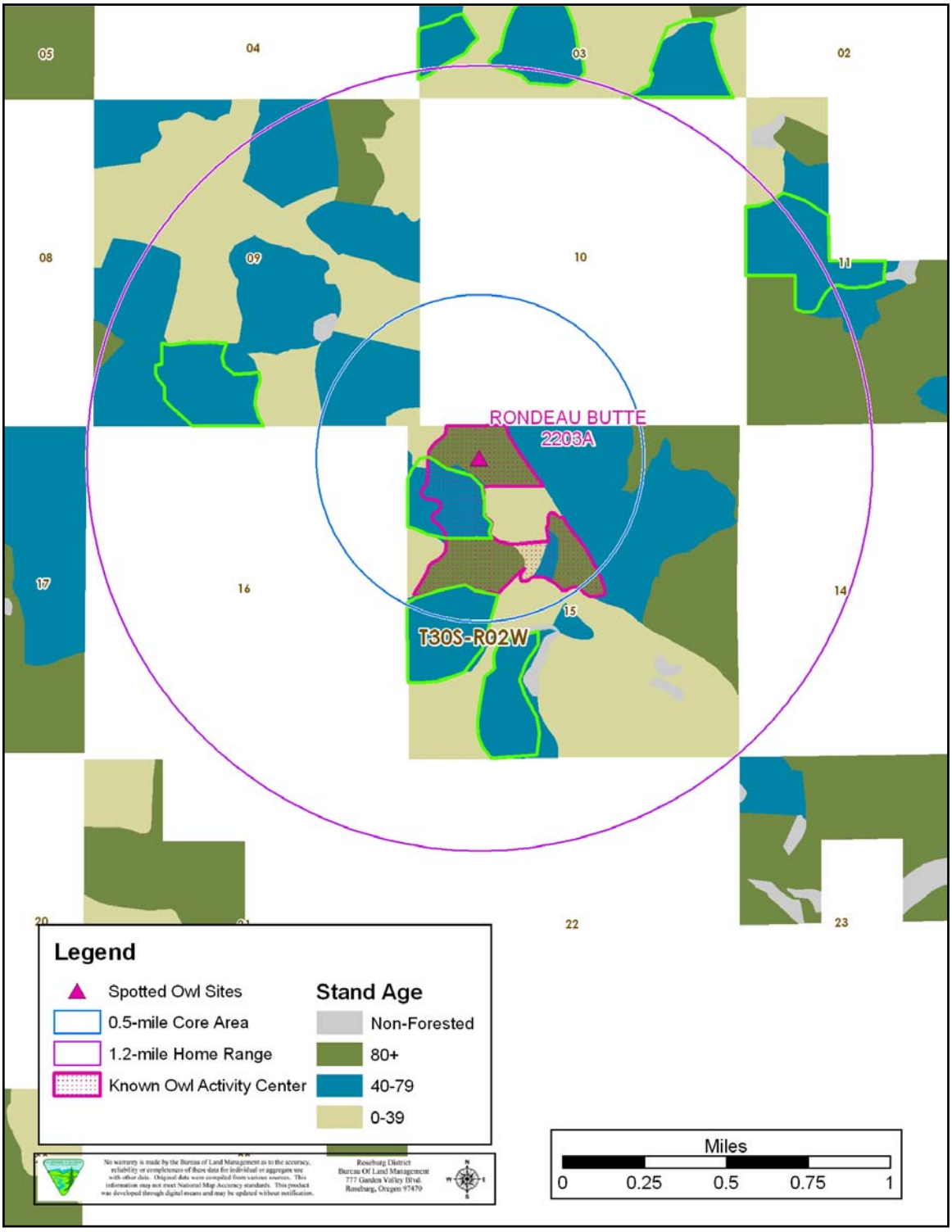
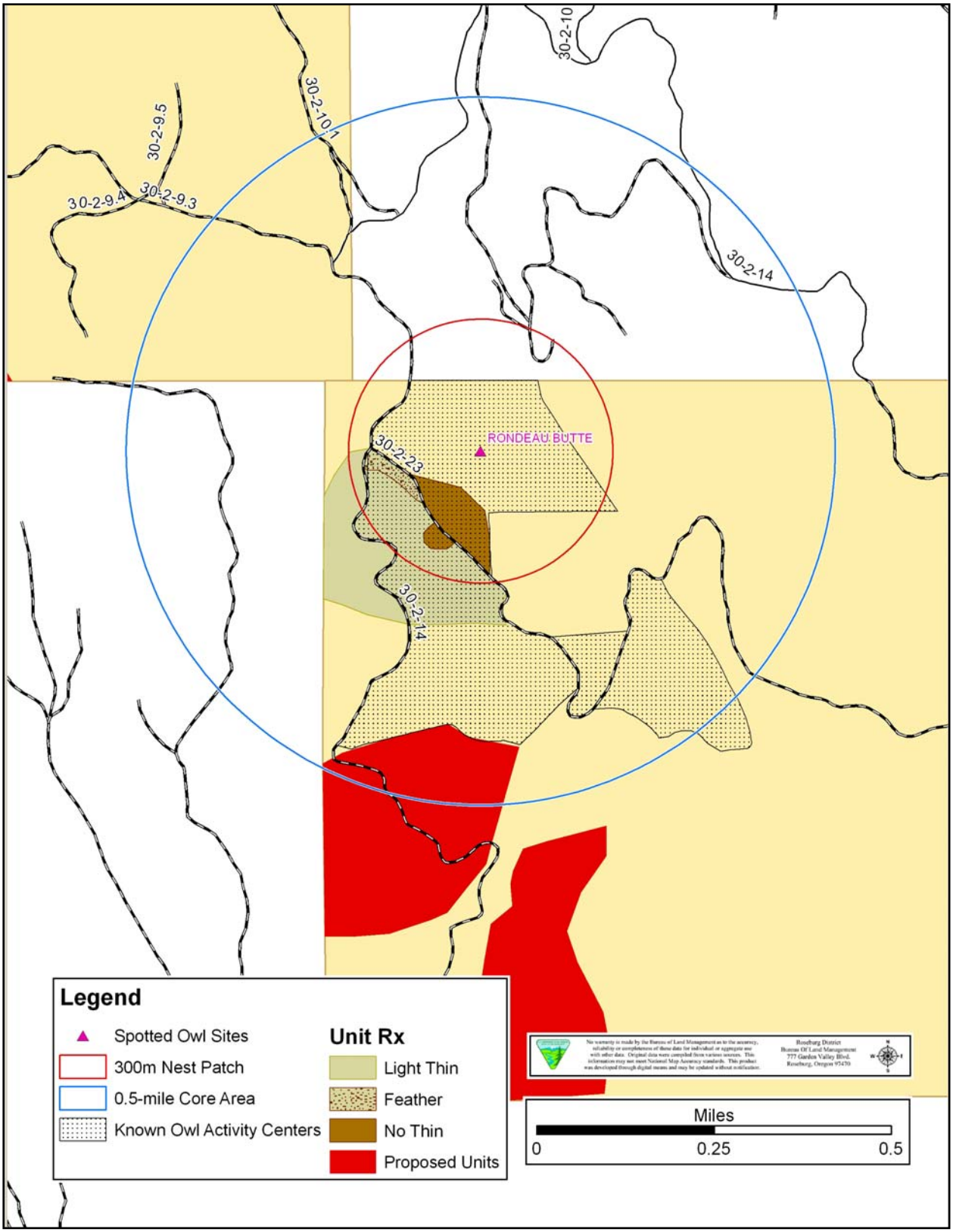


Figure B-3 Known Owl Activity Center P2203A and proposed units.

Figure B-4 Unit 30-2-15A Design



Appendix C - Botany

Scientific Name	Taxon	Status	Habitat Present	Survey Status	Survey Result
Plagiobothrys hirtus	Vascular Plant	Federally Endangered	No	N/A	N/A
Adiantum jordanii	Vascular Plant	Bureau Sensitive	Yes	Yes	Not Present
Arabis koehleri var. koehleri	Vascular Plant	Bureau Sensitive	No	N/A	N/A
Asplenium septentrionale	Vascular Plant	Bureau Sensitive	Yes	Yes	Not Present
Bensoniella oregana	Vascular Plant	Bureau Sensitive	Yes	Yes	Not Present
Botrychium minganense	Vascular Plant	Bureau Sensitive	No	N/A	N/A
Calochortus coxii	Vascular Plant	Bureau Sensitive	No	N/A	N/A
Calochortus umpquaensis	Vascular Plant	Bureau Sensitive	No	N/A	N/A
Carex brevicaulis	Vascular plant	Bureau Sensitive	Yes	Yes	Not Present
Carex comosa	Vascular Plant	Bureau Sensitive	Yes	Yes	Not Present
Carex gynodynama	Vascular Plant	Bureau Sensitive	Yes	Yes	Not Present
Carex serratodens	Vascular Plant	Bureau Sensitive	Yes	Yes	Not Present
Cicendia quadrangularis	Vascular Plant	Bureau Sensitive	No	N/A	N/A
Cypripedium fasciculatum	Vascular Plant	Bureau Sensitive	Yes	Yes	Not Present
Delphinum nudicaule	Vascular Plant	Bureau Sensitive	Yes	Yes	Not Present
Epilobium oreganum	Vascular Plant	Bureau Sensitve	Yes	Yes	Not Present
Eschscholzia caespitosa	Vascular Plant	Bureau Sensitive	Yes	Yes	Not Present
Horkelia congesta ssp. congesta	Vascular Plant	Bureau Sensitive	Yes	Yes	Not Present
Horkelia tridentata ssp. tridentata	Vascular plant	Bureau Sensitive	Yes	Yes	Not Present
Iliamna latibracteata	Vascular Plant	Bureau Sensitive	Yes	Yes	Not Present
Kalmiopsis fragans	Vascular Plant	Bureau Sensitive	No	N/A	N/A
Lathyrus holochlorus	Vascular Plant	Bureau Sensitive	Yes	Yes	Not Present
Lewisia Leana	Vascular Plant	Bureau Sensitive	Yes	Yes	Not Present
Limnanthes gracilis var. gracilis	Vascular Plant	Bureau Sensitive	Yes	Yes	Not Present
Lotus stipularis	Vascular Plant	Bureau Sensitive	Yes	Yes	Not Present
Meconella oregana	Vascular Plant	Bureau Sensitive	Yes	Yes	Not Present
Pellaea andromedaefolia	Vascular Plant	Bureau Sensitive	Yes	Yes	Not Present
Perideridia erythrorhiza	Vascular Plant	Bureau Sensitive	Yes	Yes	Not Present
Polystichum californicum	Vascular Plant	Bureau Sensitive	Yes	Yes	Not Present
Romanzoffia thompsonii	Vascular Plant	Bureau Sensitive	Yes	Yes	Not Present
Schoenopectus subterminalis	Vascular Plant	Bureau Sensitive	Yes	Yes	Not Present
Scirpus pendulus	Vascular Plant	Bureau Sensitive	Yes	Yes	Not Present
Sisyrinchium hitchcockii	Vascular Plant	Bureau Sensitive	No	N/A	N/A

Scientific Name	Taxon	Status	Habitat Present	Survey Status	Survey Result
Utricularia gibba	Vascular Plant	Bureau Sensitive	No	N/A	N/A
Utricularia minor	Vascular Plant	Bureau Sensitive	No	N/A	N/A
Wolffia borealis	Vascular Plant	Bureau Sensitive	No	N/A	N/A
Wolffia columbiana	Vascular Plant	Bureau Sensitive	No	N/A	N/A
Chiloscyphus gemmiparus	Bryophyte	Bureau Sensitive	No	N/A	N/A
Diplophyllum plicatum	Bryophyte	Bureau Sensitive	Yes	Yes	Not Present
Entosthodon fascicularis	Bryophyte	Bureau Sensitive	Yes	Yes	Not Present
Gymnomitrion concinnatum	Bryophyte	Bureau Sensitive	Yes	Yes	Not Present
Helodium blandowii	Bryophyte	Bureau Sensitive	Yes	Yes	Not Present
Meesia uliginosa	Bryophyte	Bureau Sensitive	Yes	Yes	Not Present
Schistostega pennata	Bryophyte	Bureau Sensitive	Yes	Yes	Not Present
Tayloria serrata	Bryophyte	Bureau Sensitive	Yes	Yes	Not Present
Tetraphis geniculata	Bryophyte	Bureau Sensitive	Yes	Yes	Not Present
Tetraplodon mnioides	Bryophyte	Bureau Sensitive	Yes	Yes	Not Present
Tomentypnum nitens	Bryophyte	Bureau Sensitive	Yes	Yes	Not Present
Tortula mucronifolia	Bryophyte	Bureau Sensitive	Yes	Yes	Not Present
Trematodon boasii	Bryophyte	Bureau Sensitive	Yes	Yes	Not Present
Bryoria subcana	Lichen	Bureau Sensitive	No	N/A	N/A
Calicium adspersum	Lichen	Bureau Sensitive	No	N/A	N/A
Chaenotheca subroscida	Lichen	Bureau Sensitive	Yes	Yes	Not Present
Dermatocarpon meiophyllizum	Lichen	Bureau Sensitive	Yes	Yes	Not Present
Hypogymnia duplicata	Lichen	Bureau Sensitive	Yes	Yes	Not Present
Leptogium cyanescens	Lichen	Bureau Sensitive	Yes	Yes	Not Present
Lobaria linita	Lichen	Bureau Sensitive	Yes	Yes	Not Present
Pannaria rubiginosa	Lichen	Bureau Sensitive	Yes	Yes	Not Present
Pilophorus nigricaulis	Lichen	Bureau Sensitive	No	N/A	N/A

Appendix D - Consistency of the Proposed Action with the Aquatic Conservation Strategy

The Aquatic Conservation Strategy (ACS) was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on public lands. The ACS must strive to maintain and restore ecosystem health at watershed and landscape scales to protect habitat for fish and other riparian-dependent species and resources and restore currently degraded habitats. This approach seeks to prevent further degradation and restore habitat over broad landscapes as opposed to individual projects or small watersheds. (Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl, page B-9).

ACS Components:

Key Watersheds: The proposed Middle South Umpqua/Dumont Creek Commercial Thinning and Density Management project is located entirely within the Middle South Umpqua/Dumont Creek watershed, which is designated as Tier 1 Key watershed.

Management direction pertinent to resource management activities in Key Watersheds specifies that: watershed analysis is to be completed; existing road mileage would be reduced, or if not possible, not increased; and would be given the highest priority for watershed restoration.

As described on page one of this environmental assessment, historic and present-day conditions of natural resources for the two subwatersheds constituting the project area were derived from the Deadman/Dompier Watershed Analysis and other sources. These were considered in the development of the proposed action.

As described on pages 7 and 8 of this environmental assessment, and illustrated in Table 2-2, approximately 0.9 miles of roads proposed for renovation are to be blocked and decommissioned following conclusion of commercial thinning and density management operations. Five temporary spur roads proposed for additional yarding access, totaling 0.9 miles in length, would be constructed, used and decommissioned in the same operating season. Consequently, there would be no increase in existing road density in the watershed.

Riparian Reserves: This project is designed to restore species and structural diversity and accelerate the development of late-seral forest characteristics in Riparian Reserves and riparian forest.

Watershed Restoration: As described on page two of this environmental assessment, objectives of the proposed action include control of stocking levels, establishment and management of non-conifer vegetation, and acquisition of vegetation characteristics consistent with Aquatic Conservation Strategy objectives. Consequently, the proposed action is a watershed restoration project. *Watershed Restoration* is the only ACS component that is an action, while the others are location-based or process-based).

Watershed Analysis (and Other Information): In development of the proposed commercial thinning and density management project, information from the Deadman/Dompier Watershed Analysis (USDI, BLM 1997) was used to evaluate and describe existing conditions, establish desired future conditions, and assist in alternative formulation.

As described in this document (pp. 19-20), information from the Deadman/Dompier Watershed (Appendix C) and Aquatic Habitat Inventory by the Oregon Department of Fish and Wildlife, supplemented by site-specific evaluation as discussed in the EA, were used to describe the aquatic habitat conditions within the project area (EA, pp. pp. 18-20). A description of watershed conditions, with respect to flows and water quality is contained in the Water Resources section of the EA (pp. 21-22).

The direct effects of the proposed action on fish, aquatic habitat and Essential Fish Habitat are addressed (pp. 39-43). The effects were judged to be non-existent, or negligible and discountable without potential for cumulative effects at the watershed scale.

The direct effects of the proposed action on stream flows and water quality are also addressed (pp. 43-45). No measurable or detectable increases in peak flows are anticipated. Commercial thinning and density management would not affect stream temperature. Effects to sediment would be localized. The effects were judged to be non-existent, or negligible and discountable without potential for cumulative effects at the watershed scale. There would be no effects to the timing and quantity of flow delivery.

Individual ACS Objective Assessment

ACS Objective	Site/Project Scale Assessment	5th Field Watershed Scale Assessment
	Scale Description: The proposed commercial thinning and density management project is located in the South Umpqua River – Dompier Creek and Deadman Creek six-field subwatersheds, encompassing roughly 28,900 acres. The BLM manages approximately 36 percent of the forested acres in the two subwatersheds. Units proposed for treatment total 290 acres representing approximately one percent of the total forested area, and 2.8 percent of the BLM-managed forest lands.	Scale Description: The project area is in the Middle South Umpqua/Dumont Creek fifth-field watershed, which encompasses approximately 97,800 acres. The BLM manages approximately 10,525 acres or 10.8 percent of the watershed area. Units proposed for treatment represent approximately 0.3 percent of the total watershed area.
1. Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.	Within the South Umpqua River – Dompier Creek and Deadman Creek six-field subwatersheds, the proposed action would thin riparian stands in the Matrix allocations and a Known Owl Activity Center managed as unmapped Late-Successional Reserve. As discussed in the EA (pp. 30, 32 and 42), trees within these treated stands would attain larger heights and diameters in a shorter amount of time than if left untreated, speeding the attainment of this objective. Density management would also facilitate stratification of canopy layers	This treatment would also speed attainment of this objective at the watershed scale.
2. Maintain and restore spatial and temporal connectivity within and between watersheds	Within the subwatersheds, as described in the EA (p. 43), the proposed project would have no influence on aquatic connectivity because there would be no construction of any stream crossings with the potential to impede upstream and downstream movement of aquatic vertebrate and invertebrate species. Consequently, the proposed action would maintain existing connectivity at the site scale.	Within the watershed, the proposed project would have no influence on aquatic connectivity. Therefore this treatment would maintain the existing connectivity condition at the watershed scale.
3. Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations	As discussed in the EA (pp. 44-45), thinning and density management treatments would not reduce canopy closure to an extent that would influence water yields and in-stream flows, because the remaining trees generally use any increased soil moisture that becomes available following timber harvest. As further stated in the EA (p. 41), the buffers would also prevent disturbance to stream channels and stream banks, thus maintaining the physical integrity of the aquatic system at the site scale.	This treatment would also maintain the physical integrity of the aquatic system at the watershed scale.
4. Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.	Project design criteria would ensure that water quality would not be adversely impacted by the proposed action. As discussed in the EA (p. 41-43), variable width "no-harvest" buffers on streams would retain shading and hence maintain water temperature. "No-harvest" buffers would prevent disturbance to stream channels and stream banks and intercept surface run-off allowing sediment transported by overland flow to precipitate out before reaching active waterways. Therefore, water quality would be maintained the existing water quality at the site scale.	Based on the information discussed at the site scale, this project would also maintain water quality at the watershed scale.

5. Maintain and restore the sediment regime under which aquatic ecosystems evolved.	As previously described, "no-harvest" buffers would prevent disturbance to stream channels and stream banks and intercept surface run-off allowing sediment transported by overland flow to precipitate out before reaching active waterways, thus maintaining the existing sediment regime.	This project would maintain the existing sediment regime at the watershed scale as well.
6. Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing.	As discussed in EA (pp. 44-45), thinning and density management would not reduce canopy closure to the extent it could potentially influence in-stream flows, nor would partial removal of vegetation on one percent of the affected sub-watersheds. New road construction would not extend the drainage network or contribute to a potential increase in peak flow because the roads would be located on ridge tops or stable side slopes and disconnected from the drainage network. This would maintain stream flows within the range of natural variability at the site scale.	As discussed at the site scale, thinning treatments would not reduce canopy closure to an extent that could potentially influence in-stream flows. Therefore, at the larger watershed scale, this treatment would also maintain stream flows within the range of natural variability.
7. Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and woodlands.	As discussed in #6 above, this project would maintain stream flows within the range of natural variability at the site scale. Therefore, it would also maintain stream interactions with the floodplain and respective water tables at the site scale.	At the watershed scale, this project would also maintain stream interactions with the floodplain and respective water tables within the range of natural variability.
8. Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.	An objective of the proposed action treatment is to return riparian forest to a more natural density and growth trajectory. Therefore this treatment would serve to restore plant species composition and structural diversity at the site scale.	The proposed treatment is designed to return riparian stands to a more natural density and growth trajectory. Therefore this treatment would serve to restore plant species composition and structural diversity at the larger watershed scale as well.
9. Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.	As mentioned previously, one of the objectives of the proposed action is to restore riparian stand conditions. Implementation of riparian restoration projects will help restore adequate habitat to support riparian-dependent species at the site scale.	The riparian restoration components of the proposed action would help restore adequate habitat to support riparian-dependent species at the watershed scales.

Summary: Based upon the information discussed above, the proposed action would meet Aquatic Conservation Strategy objectives at the site and watershed scale, and based upon the restorative nature of the action, this project would not retard or prevent attainment of ACS objectives. In many instances, it would actually speed attainment of these objectives. Therefore, this action is consistent with the Aquatic Conservation Strategy, and its objectives at the site and watershed scales.