

**Environmental Assessment
And
Finding of No Significant Impact**

Slim Jim Project

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Glendale and Butte Falls Resource Areas
Douglas and Jackson Counties, Oregon

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Abstract:

The Glendale and Butte Falls Resource Areas, Medford District, Bureau of Land Management (BLM) propose to harvest timber, implement density management activities, fuels reduction treatments, transportation management: temporary road construction, maintenance, decommissioning, and road blocking/gating in Matrix, Riparian Reserves, and Late Successional Reserve federal lands within the Upper Cow Creek and Evans Creek fifth-field watersheds. The Planning Area is located in Township (T) 31 S, Range (R) 3 W, Sections 19, 29; T 31S, R 4W, Sections 25, 27, 28, 34; T 32S, R 4W, Sections 1, 3, 11, 13, 24 and T 32S, R 3W, Section 6, 7, 17, 18, 19, 30, 31.

This environmental assessment discloses the predicted environmental effects of three alternatives: Alternative 1 (No Action), Alternative 2 (Proposed Action), and Alternative 3. The Proposed Action includes harvesting timber on approximately 57 acres of Matrix land by regeneration harvest, overstory removal, and commercial thin. Hazardous fuels reduction treatments are also proposed on 586 acres of the Matrix land use allocation. The South Umpqua/Galesville Late Successional Reserve (LSR) and Riparian Reserves (RR) include density management thinning (commercial and non-commercial) on approximately 808 acres. Harvesting methods include tractor, high lead cable, and helicopter yarding systems. Fuels reduction treatments (slash/handpile/burn or lop/scatter) would be conducted on all land use allocations to reduce fire hazard. Harvesting and associated forest management activities are planned to occur between 2005 and 2015 with the majority of units being treated within five years.

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FINDING OF NO SIGNIFICANT IMPACT

Based upon review of the EA (Environmental Assessment #OR-118-04-014) and supporting project record, the Glendale and Butte Falls Field Managers have determined that the action alternatives (Alternative 2 & 3) are not major federal actions and would not significantly affect the quality of the human environment, individually or cumulatively with other actions in the general area. No environmental effects meet the definition of significance in context or intensity as defined in 40 CFR 1508.27. Therefore, an environmental impact statement is not needed. This finding is based on the following discussion:

Context. The action alternatives are site-specific actions directly involving approximately 1,451 acres of BLM (Bureau of Land Management) administered land that by themselves do not have international, national, region-wide, or state-wide importance. Activities are located within the following land use allocations: Matrix, Late Successional Reserve, and Riparian Reserves, within the Upper Cow Creek and West Evans Creek fifth-field watersheds.

The discussion of the significance criteria that follows applies to the intended action and is within the context of local importance. Chapter 3 of the EA details the effects of the action alternatives. None of the effects identified, including direct, indirect and cumulative effects, are considered to be significant and do not exceed those effects described in the *Medford District Resource Management Plan/Final Environmental Impact Statement* (June 1995).

Intensity. The following discussion is organized around the Ten Significance Criteria described in 40 CFR 1508.27.

1. Impacts may be both beneficial and adverse. The predicted environmental effects of the action alternatives, most noteworthy, include: **1)** enhancement of late-successional forest conditions (RMP, p. 21) and providing a commodity by-product as described in the 2003 O&C Settlement Agreement; **2)** producing a sustainable supply of timber and other forest commodities on Matrix land to provide jobs and contribute to community stability (RMP, p. 38); **3)** fuels reduction treatments on 1,303-1,451 acres (586 acres for hazardous fuels reduction and 717-865 acres of post-harvest slash fuels reduction) is a very small portion of the fifth-field watershed (3 percent) and the cumulative effect of increasing the fire risk is minimal; **4)** activities would cause soil displacement, compaction and loss of productivity. Harvesting would result in compaction on about 7% of cable harvest units, 1% of helicopter-logged units, and 13% of tractor logging units. Compaction would result on about 0.1 % of the Project Area with temporary road construction for alternative 2. These levels are within RMP/EIS guidelines of 12% (pp. 4-12-13); **5)** removal of 29 acres of suitable critical habitat for spotted owls (alternative 2 only) and downgrade of 28 acres of suitable critical habitat to dispersal habitat (alternative 2 only). Modification of approximately 1,000-1,075 acres of spotted owl habitat by modifying understory and ground structure through by the following: degrade 343-390 acres of dispersal habitat, removal of 24-52 acres of dispersal habitat below 40% canopy cover, and temporarily

degrade 47 acres of suitable critical habitat also on Late Successional Reserve land. In addition, the action alternatives would degrade 586 acre of nesting, roosting, or foraging habitat on Matrix land through fuels/non commercial density management. The U.S. Fish and Wildlife Service (USFWS) compared the proposed action with other actions within the Section 7 watershed (West Fork, Middle Cow, and Upper Cow Creek 5th field watersheds), and found the loss of suitable habitat to be reasonably well distributed throughout the biological opinion action area, and across the Upper Cow Creek watershed (USDI/USFWS 2003, p. 71). While the action alternatives would have adverse effects to the Critical Habitat Unit (CHU) OR-32 in the form of nesting, roosting, and foraging loss or downgrading; the USFWS does not believe that the actions would preclude the ability of the CHU to function as intended. The management is expected to be within LSR and Matrix guidelines and effects are to be within the predictions of the FSEIS (USDA/USDI 1994); **6**) and would not preclude spotted owl movement between LSRs (p. 103); **7**) potential for disturbance to northern spotted owls and fishers (see significance criteria #9 below); and **8**) no potential of negative impacts (result in the elevation of their status to any higher level of concern including the need to list under the ESA) for any of the wildlife, plant or fish Special Status Species. None of the environmental effects disclosed above and discussed in detail in Chapter 3 of the EA are considered significant.

- 2. The degree to which the selected alternative will affect public health or safety.** Public health and safety would not be affected. The action alternatives are comparable to other projects which have occurred within Medford District with no unusual health or safety concerns.
- 3. Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farm lands, wetlands, wild and scenic rivers, or ecologically critical areas.** There are no historic or cultural resources, prime farm lands, wetlands, wild and scenic rivers or wildernesses located within the project area. Chief Miwaleta Park is located within the planning area but would not be affected by the proposed action.
- 4. The degree to which the effects on the quality of the human environment are likely to be highly controversial.** The effects of the action alternatives on the quality of the human environment are adequately understood by the interdisciplinary team to provide analysis for the decision. A complete disclosure of the predicted effects is contained in Chapter 3 of the EA.
- 5. The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.** The action alternatives are not unique or unusual. The BLM has experience implementing similar actions in similar areas and have found effects to be reasonably predictable. The environmental effects to the human environment are fully analyzed in Chapter 3 of the EA. There are no predicted effects on the human environment which are considered to be highly uncertain or involve unique or unknown risks.

6. **The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.** The action alternatives do not set a precedent for future actions that may have significant effects nor does it represent a decision in principle about future consideration. Any future projects would be evaluated through the NEPA (National Environmental Policy Act) process and would stand on their own as to environmental effects.
7. **Whether the action is related to other actions with individually insignificant but cumulatively significant impacts.** The interdisciplinary team evaluated the action alternatives in context of past, present and reasonably foreseeable actions. Significant cumulative effects are not predicted. A complete disclosure of the effects of the Proposed Action is contained in Chapter 3 of the EA.
8. **The degree to which the action may adversely affect districts, sites, highways, structures, or other objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.** The action alternatives would not adversely affect districts, sites, highways, structures, or other objects listed in or eligible for listing in the National Register of Historic Places, nor would the activities cause loss or destruction of significant scientific, cultural, or historical resources.
9. **The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.** The action alternatives would result in the potential for disturbance to northern spotted owls. Alternative 2 would remove 29 acres of suitable critical habitat for spotted owls and downgrade 28 acres of suitable critical habitat to dispersal habitat. The action alternatives would degrade 343-390 acres of dispersal habitat and remove 24-52 acres of dispersal habitat below 40% canopy cover, and temporarily degrade 47 acres of suitable critical habitat also on Late Successional Reserve land. The proposed action would degrade 586 acre of nesting, roosting, or foraging habitat on Matrix land through fuels/non commercial density management. The harvesting activities within the Slim Jim Environmental Assessment were included within the programmatic habitat modification biological assessment prepared by the interagency Level 1 Team (terrestrial subgroup) for FY 2004-2008 projects within SW Oregon which may modify the northern spotted owls (USDI/USFWS 2003 Biological Opinion).

Since Galesville Reservoir, located at the base of Upper Cow Creek watershed, is a complete barrier to anadromous fish passage, the Oregon Coast coho salmon and Oregon coast steelhead located above Galesville Dam are not considered to be part of the candidate T&E Evolutionary Significant Unit (ESU). These fish above Galesville Dam are artificially planted and landlocked so it is impossible for juvenile fish to naturally migrate downstream to complete their lifecycle, and contribute to the recovery of the species. As a result, there are no T&E species or critical habitat present above the Galesville Dam. Therefore, the portion of the Slim Jim project above the Galesville Dam is exempt from consulting with NOAA Fisheries. The 273 acres of hazardous fuels reduction treatments located in the adjacent

Evans Creek watershed would have no effect on Southern Oregon/Northern California coho salmon (ESA-listed as Threatened) because PDFs, combined with treatment technique (handpile/burn/underburn) and location, would prevent sediment from entering streams and from altering peak flow in the species' nearest habitat, 1.3 miles downstream in Evans Creek.

10. Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment. The action alternatives do not violate any known federal, state, or local law or requirement imposed for the protection of the environment. Furthermore, the activities are consistent with applicable land management plans, policies, and programs (EA, Chapter 1.5).

ENVIRONMENTAL ASSESSMENT

Chapter 1.0 Project Scope

1.1 Proposed Action

The Proposed Action within Matrix lands includes harvesting timber on approximately 57 acres of forest land by regeneration, overstory removal, and commercial thin. Harvesting methods include conventional tractor, high lead cable, and helicopter yarding systems. Piling and burning would be conducted on 57 acres of created harvest residue (slash) to reduce fire hazard. Hazardous fuels reduction treatments would occur on 586 acres would not be commercially harvested at this time. Riparian fuels reduction is included within these 586 acres, up to 25 feet of the stream bankful width. Of these hazardous fuels reductions, 273 acres are located in the Evans Creek fifth-field watershed, within the Butte Falls Resource Area. Transportation management activities on Matrix land include road maintenance on 5 miles and blocking 1.20 miles of road by gating or trench barricading.

Activities proposed within the LSR include 447 acres of commercial density management, 361 acres of non-commercial density management, and 808 acres of activity fuels treatments (residual slash from density management treatments). Riparian thinning would also occur within those 808 acres, up to 25-150 ft of the stream bankful width. Transportation management activities on LSR include road maintenance on 29 miles, constructing 0.88 miles of temporary roads that would be decommissioned after use, blocking 0.54 miles of road by gating or trench barricading, and 0.80 miles of road decommissioning (as funding is available).

Harvesting and other forest management activities are planned to occur between 2005 and 2015, with the majority of units being treated within five years. BLM planning decisions and harvest activities would apply only to BLM-administered lands. These BLM lands are part of the Oregon and California O&C (Oregon and California) revested railroad lands and have land use allocations of Late Successional Reserve (LSR), Matrix, and Riparian Reserves under the *Medford District Record of Decision and Resource Management Plan (RMP, 1995)*.

1.2 Project Location

The project area is located approximately 6 miles east of the town of Azalea, Oregon, in Douglas and Jackson Counties and approximately 30 miles northeast of Grants Pass, Oregon. Project activities are proposed on federal land managed by the Glendale Resource and Butte Falls Resource Areas, Medford District, BLM (Bureau of Land Management). The project area lies within the Upper Cow Creek and Evans Creek 5th field watersheds (Cow Creek Galesville & Upper West Fork Evans Creek 6th field watersheds). See Appendix 4. Elevations within the

Planning Area range from 1,880 feet at Galesville Reservoir to nearly 5,104 feet at Cedar Springs Mountain (T32S-R4W, section 25). Average annual precipitation is 41-60 inches.

1.3 Background

The Medford District RMP, developed to follow the direction of the Northwest Forest Plan, designated a sustainable Allowable Sale Quantity (ASQ) per year of 57.1 MMBF. Successive years following the Northwest Forest Plan the Bureau of the Land Management and the U.S. Forest Service have not attained this annual quantity. In 2003, a collective of local timber companies, individuals, school districts, counties, and Secretaries of the Interior and Agriculture entered into the O&C Settlement Agreement to rectify the gap between the annual supply of timber and the analyzed sustainable volume level in the RMP.

As stated in the 2003 O&C Settlement Agreement, “Agencies [Forest Service and BLM] will use their best efforts every year beginning in Fiscal Year 2005:...to offer thinning sales [where development of late successional or riparian habitat is the primary objective] of approximately 300 million board feet per year to the extent that and for so long as such sales are consistent with the ecological objectives of the Northwest Forest Plan,” (Oregon and California Railroad Act Settlement Agreement 2003, 3.0 Agreements (3.2)).

1.4 Purpose and Need for the Proposal

The purpose of this project is to meet the needs identified in the Medford District RMP and provide a commodity by-product as described in the 2003 O&C Settlement Agreement. While doing so, actions within the late-successional reserve would comply with the objectives in the Medford District Resource Management Plan (ROD) to manage late-successional reserves “to enhance and/or maintain late-successional forest conditions” (USDI 1995, pg. 21).

Multiple projects are proposed to implement RMP directives within the South Umpqua/Galesville LSR including density management (commercial and non-commercial), temporary road construction, and road decommissioning. Project activities unique to the adjacent Matrix lands includes: regeneration harvest, overstory removal, commercial thin, and hazardous fuels reduction. Activities common to both land use allocations are riparian thinning, maintenance on roads used for forest management activities, and fuels reduction on created slash from forest treatments. The desired condition in Late Successional Reserves is one in which treated stands increase or maintain vigor and have an increased rate of development of older forest characteristics. Specifically, the stands have increased tree diameter growth and crown development, stimulated understory shrub layer development, increased structural diversity, and larger trees that could become sources of high-quality CWD habitat features both snags and logs. For the Matrix, the desired condition after treatment would be establishment of a new vigorous conifer and hardwood stand within older stands and a reduction in competition on selected conifer vegetation and an increase in growth and vigor for younger stands.

Project Objectives:

Late Successional Reserves:

- 1) Provide a distribution, quantity, and quality of old-growth forest habitat sufficient to avoid eliminating future management options.
- 2) Provide habitat for populations of species that are associated with late-successional forest.
- 3) Help ensure that late-successional species diversity will be conserved.
- 4) Provide a component of the Aquatic Conservation Strategy offering core areas of high quality stream habitat.”

(South Umpqua/Galesville Late Successional Reserve Assessment, Amended May 2004, p. S-1).

Matrix:

- 1) Provide for a sustainable supply of timber and other forest commodities to provide jobs and contribute to community stability. (Medford District RMP p. 38 Matrix objectives)
- 2) Manage developing stands on available lands to promote tree survival and growth and to achieve a balance between wood volume production, quality of wood, and timber value at harvest. (Medford District RMP p. 72 Timber objectives)

Riparian Reserves:

- 1) Apply silvicultural practices for riparian reserves to control stocking, reestablish and manage stands, and acquire desired vegetation characteristics needed to attain Aquatic Conservation Strategy and riparian reserve objectives (RMP, p. 27).
- 2) Design prescribed burn projects and prescriptions to contribute to attainment of Aquatic Conservation Strategy and riparian reserve objectives (RMP, p.30).

Fire/fuels Management:

- 1) Use prescribed fire to meet resource management objectives. This will include but not be limited to fuels management for wildfire hazard reduction, restoration of desired vegetation conditions, management of habitat, and silvicultural treatments (RMP, p.89).
- 2) Reduce both natural and activity based fuel hazards through methods such as prescribed burning, mechanical or manual manipulation of forest vegetation and debris, removal of forest vegetation and debris, and combinations of these methods (RMP, p. 91).

Roads:

- 1) Correct problems associated with high road density by emphasizing the reduction of minor collector and local road densities where those problems exist (RMP, p.84).
- 2) [Barricade or block roads] to reduce road surface damage and therefore minimize erosion and sedimentation (RMP, p.164).

1.5 Plan Conformance

This EA (Environmental Assessment) conforms with the *Final Supplemental Environmental Impact Statement and Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (Northwest Forest Plan FSEIS, 1994 and ROD, 1994); the *Final-Medford District Proposed Resource Management Plan/Environmental Impact Statement and Record of Decision* (EIS, 1994 and RMP/ROD, 1995); the *Final Supplemental Environmental Impact Statement: Management of Port-Orford-Cedar in Southwest Oregon* (FSEIS, 2004 and ROD, 2004); the *Final Supplemental Environmental Impact Statement To Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines* (FSEIS, 2004 and ROD, 2004) and the *Final Supplemental Environmental Impact Statement Clarification of Language in the 1994 Record of Decision for the Northwest Forest Plan National Forests and Bureau of Land Management Districts Within the Range of the Northern Spotted Owl, and Proposal to Amend Wording About the Aquatic Conservation Strategy* (FSEIS, 2003 and ROD, 2004).

The Upper Cow Creek and Evans Creek *Watershed Analyses and South Umpqua/Galesville Late Successional Reserve* are incorporated by reference; the watershed analyses and LSR assessment provide background for the project planning and but are neither NEPA nor decision documents.

1.6 Permits and Approvals Required

The following permits and approvals are required prior to project implementation:

- License agreements with adjacent landowners to have a third party haul timber have been completed.
- In compliance with the Oregon Smoke Management Plan, prescribed burning activities on the Medford District require pre-burn registration of all prescribed burn locations with the Oregon State Forester.

1.7 Decision to be Made

The Field Managers of the Glendale and Butte Falls Resource Areas are the officials responsible for deciding whether or not to prepare an environmental impact statement, and whether to approve projects as proposed, not at all, or to some other extent for their respective Resource Areas.

Chapter 2.0 - Alternatives

2.1 Introduction

This chapter compares Alternative 1 (No Action Alternative) with the two action alternatives, Alternative 2 (Proposed Action) and Alternative 3 as specified in 40 CFR (Code of Federal Regulations) § 1502.14. Descriptions summarize potential actions and outputs. Project Design Features were identified to ensure project compliance with higher level NEPA documents, laws and BLM guidelines. There were unresolved conflicts concerning alternative uses of available resources identified by the interdisciplinary team, therefore a procedural requirement to develop additional action alternatives was needed (**Appendix 1**). As such, the alternatives that will be analyzed in detail in this EA include the Alternative 1 (No Action), Alternative 2 (Proposed Action), and Alternative 3.

2.2 Alternatives. This section describes each alternative.

2.2.1 Alternative 1 (No Action)

The No Action Alternative provides a baseline for the comparison of the alternatives and describes the existing condition and the continuing trends. Selection of this alternative would not meet the purpose and need of the project (described in Chapter 1) to harvest timber within the Matrix and to enhance late-successional forest conditions. Fuels reduction treatments would also not occur under the No Action Alternative. Selection of this alternative would not constitute a decision to reallocate these lands to non-commodity uses. Road decommissioning would also not occur under this alternative. There would be no gating to reduce road related and wildlife management related impacts. Road maintenance would be dependant on available funding and reciprocal road use agreements. Future forest management treatments and transportation management in this area would not be precluded and could be analyzed under subsequent environmental analysis.

2.2.2 Alternative 2 (Proposed Action)

This alternative includes treatments on, Matrix, Riparian Reserves, and LSR land use allocations in the Slim Jim Planning area. The Proposed Action would meet the purpose and need objectives stated in Chapter 1 for Matrix lands of producing a sustainable supply of timber and other forest commodities to provide jobs and contribute to community stability (RMP, p. 38) as well as for LSR lands to enhance late-successional forest conditions (RMP, p. 21) and provide a commodity by-product as described in the 2003 O&C Settlement Agreement.

Table 2-1 located at the end of this chapter provides a list of specific harvest unit treatments.

Within the Matrix, the proposed action would harvest timber on 57 acres of forest land by regeneration harvest, overstory removal, and commercial thin. Harvesting methods include 16

acres of high lead cable yarding systems and 41 acres of helicopter yarding system. No riparian thinning is proposed within the Matrix commercial harvest units. Piling and burning would be conducted on 57 acres of created harvest residue (slash) to reduce fire hazard and prepare the site for planting of conifer seedlings on 29 of these acres. Hazardous fuels reduction treatments would occur on 586 acres that would not be commercially harvested at this time. Riparian fuels reduction is included within these 586 acres, up to 25 feet of the stream bankful width (see table 2-1). Treatments include manual methods in combination with prescribed burning. Transportation management activities in the Matrix include road maintenance on approximately 5 miles and blocking 1.20 miles of road by gating or trench barricade (see Tables 2-3 & 2-4). Harvesting and associated forest management activities are planned to occur between 2005 and 2015, with the majority of units being treated within five years.

Activities proposed within the LSR include 447 acres of commercial density management which would remove trees less than 20 inches DBH (diameter at breast height), 361 acres of non-commercial density management, and 808 acres of activity fuels treatments (residual slash from density management treatments) by the manual method (slash/handpile/burn or lop/scatter). Riparian thinning and riparian fuels reduction would also occur within the 808 acres up to 25-150 ft of the stream bankful width (see table 2-1). Harvesting methods include 53 acres of tractor yarding and 394 acres of high lead cable yarding systems. Transportation management activities on LSR include road maintenance on approximately 29 miles, constructing 0.88 miles of temporary roads that would be decommissioned after use, blocking 0.54 miles of road by gating or trench barricade, and 0.80 miles of road decommissioning to reduce overall road density.

2.2.2.1 Harvest Methods (Alternative 2)

See Silvicultural Prescriptions for specific harvest unit descriptions (Appendix 3).

Matrix

The objective of regeneration (RH) and overstory removal (OR) harvests is to remove mature timber in a manner that creates conditions for a new stand of timber to become established. Treated areas would follow RMP standards and guidelines for green tree retention, snags, and coarse woody debris. In general, RH and OR prescriptions would harvest timber, leaving at least 6-8 large (>20" dbh) conifers per acre. These conifers would be composed of existing species and would be across the range of diameters. Additional trees would be left where coarse woody debris present on the site did not meet RMP standards. In addition, three-five large hardwood trees per acre would be retained (where available) as well as existing snags and down logs. The RH unit would be burned, if necessary, to prepare the site and then planted. In the OR unit, the intent is to utilize existing young conifer reproduction for re-growth and inter-plant as needed, rather than relying solely on planting. If needed, the OR unit would be hand-piled and burned to reduce fuels and to prepare the site for inter-planting. RH and OR units would receive follow-up maintenance and protection treatments such as brushing and pruning of sugar pine for white pine blister rust through establishment.

The objective of the commercial thin (CT) treatment is to control (reduce) stand stocking to increase growing space for and redistribute growth to remaining selected trees for production of commercial products. Stand yield and quality would increase. While the thinning in this proposal would be from below, some larger diameter trees (codominants and dominants) may be removed where they exist in clumps.

Late Successional Reserve (LSR)

Commercial density management (CDM) and non-commercial density management (NDNM) treatments within Late Successional Reserves are proposed so that desired late successional stand characteristics can develop, desired stand components may be retained, and stand growth/vigor is promoted.

Commercial – Commercial density management treatments would remove merchantable size logs (up to 20 inches dbh) from the site and would loosely resemble commercial thins. The objective of the treatment would be however, the development of stands with characteristics of older forests rather than yield. For this proposal, density management treatments would be designed to enhance and promote desired stand characteristics for wildlife. Treatments would reduce stand densities so that the competition for light, water, nutrients and growing space is decreased on desired leave trees. Long-term stand vigor and growth (forest health) would be promoted. While wood volume would result from the treatment, production of wood volume at the present time or for the future is not a primary objective. Wood volume produced would be a by-product of the treatment.

Non-commercial – The objective of non-commercial density management treatments would be the same as for commercial treatments, that is to reduce stand densities. Treatments would not remove commercial size trees from the site (although some merchantable size trees up to 10” dbh may be felled or girdled and left on the site for wildlife or other objectives).

Table 2-1 lists proposed treatments on a unit by unit basis for Alternative 2 & 3 and Table 2-5 summarizes the proposed activities for these alternatives.

2.2.2.2 Fuels Treatments (Alternative 2)

Matrix

Fuel reduction treatments are proposed to reduce existing hazardous fuels and to reduce slash created by commercial harvest activities. Treatments designed to remove activity slash would include hand-piling and burning material between 1 and 7 inches in diameter and greater than 3 feet in length. Fuel outside this size range would be left untreated, aside from some smaller fuels that would be included in the piles to create optimal ignition. This treatment type would be conducted on the 643 acres (586 acres for reducing existing hazardous fuels and 57 acres proposed for commercial harvest activity).

Future underburns may also be implemented to help maintain the stand in its desired condition and prevent a build-up of fuels. These underburns would be light treatments and would help maintain the reduced fire hazard following the initial slashing and pile burning treatment. Typically, maintenance underburns would occur 2-7 years following the initial treatments and would be driven by the condition of the stand and regrowth of slashed vegetation. Underburning is the application of prescribed fire within areas where residual trees and shrubs are present. The prescribed fire objective is to reduce the fuel hazard from both dead and down woody material and to reduce the amount of “ladder” fuels present. Ladder fuels consist of live or standing dead vegetation such as shrubs and small trees in the understory and live and dead branches close to the ground level on overstory trees.

Late Successional Reserve

Fuel reduction treatments are proposed to reduce existing hazardous fuels and to reduce slash created by density management activities. The fuel reduction treatments to mitigate activity slash may include slashing, hand-piling, pile-burning, underburning, and/or lop-and-scatter, but would be specifically determined by post-activity evaluations. The lop-and-scatter method would be used on cut material up to 6 inches in diameter. This method is normally used when there is very little treatment needed within a unit. Areas that pose an increased fire risk due to residual activity slash would be hand-piled and burned rather than receive a lop-and-scatter treatment. Post-harvest fuels treatments

Table 2-2 provides a list fuels reduction treatments for the Matrix and LSR land use allocations and a comparison between the action alternatives.

2.2.2.3 Transportation (Alternative 2)

Matrix

The proposed transportation activities includes road maintenance which is composed of surface blading, roadside brushing, spot rocking, catch basin cleaning, surface replacement, ditch clearing, slump removal, slide removal, culvert cleaning and culvert replacement. Approximately, 5.3 miles of existing roads would be maintained and 1.20 miles of BLM managed roads would be blocked or gated that are no longer needed for management purposes or utilized by the public. Road closure such as blocking and gating roads would reduce sedimentation into streams, compaction, and future road maintenance needs. The description of treatments for individual road segments is displayed in Table 2-3.

Late Successional Reserve

Approximately, 29 miles of existing roads would be maintained, 0.88 miles of temporary roads would be constructed and then decommissioned to access density management areas. Temporary road construction was designed to reduce impacts such as placement on the ridgetop, on low slope conditions, and minimization through granitics and other sensitive soils. Helicopter logging was evaluated as an alternative to temporary road construction and the commercial by-

product produced from CDM was not substantial enough to for it to be an economical feasible alternative. Decommissioning is proposed on 0.80 miles of existing roads and 0.54 miles would be blocked or gated to reduce sedimentation into streams, compaction, and future road maintenance needs. See table 2-4 for a list of the following road activities: temporary use and construction, blocking/gating, and decommissioning.

2.2.3 Alternative 3

This alternative partially meets the purpose and need as stated in Chapter 1.

2.2.3.1 Harvest Methods (Alternative 3)

Matrix

As a result of the considerations presented through the scoping process, no regeneration harvest, overstory removal, or commercial thinning treatments are proposed under alternative 3. The 28 acres of commercial thinning was deferred due to the lack of accessibility without temporary road construction and economic infeasibility of helicopter logging this unit without incorporating additional commercial product to be retrieved from other areas, such as the two regeneration harvest and overstory removal units. Three Matrix units (57 acres) have been deferred from treatment at this time.

Late Successional Reserve

Activities proposed within the LSR include 356 acres of commercial density management which would remove trees less than 20 inches DBH (diameter at breast height) and 361 acres of non-commercial density management. Four units (91 acres) are deferred under this alternative as a result of inaccessibility without temporary road construction and the economic infeasibility to retrieve the by-product through helicopter logging.

Harvesting methods include 53 acres of tractor yarding and 303 acres of high lead cable yarding systems.

2.2.3.2 Fuels Treatments (Alternative 3)

Matrix

Fuels reduction treatments are similar to those proposed under alternative 2 including the riparian fuels treatment (see table 2-1), slash/handpile/burn on 586 acres of noncommercial density management units. Treatments include manual methods in combination with prescribed burning.

Late Successional Reserve

Activity fuels treatments (residual slash from density management treatments) would occur on 717 acres by manual methods either slash/handpile/burn or lop & scatter depending on the fuel loadings after density management. These acres also include riparian thinning, as described in alternative 2 (see table 2-2). Fewer post-harvest fuels treatments are proposed in alternative 3 due to the four deferred CDM units described above, where slash would not be created at this time.

2.2.3.3 Transportation (Alternative 3)

Matrix

Road maintenance activities would be similar as those described in alternative 2. Approximately, 2.8 miles of existing roads would be maintained and 1.20 miles would be blocked or gated.

Late Successional Reserve

Approximately, 27.8 miles of existing roads would be maintained. Transportation management activities on LSR include blocking 0.54 miles of road would be by gating or trench barricading, and 0.80 miles of road decommissioning to reduce overall road density. No temporary road construction is proposed under this alternative.

Table 2-1. Action Alternatives Harvest Treatments

Matrix							
Unit	ACRES	Stream Buffer (ft)	Spotted owl CHU OR-32	Alternatives 2		Alternative 3	
				RX	YARDING	RX	YARDING
29-1	54	25	CHU	NDNM/Fuels	-----	NDNM/Fuels	-----
29-3	181	25	CHU	NDNM/Fuels	-----	NDNM/Fuels	-----
6-3	16	170		RH	cable	defer	
30-1a	13	170	CHU	OR	helicopter	defer	
30-1b	28	170	CHU	CT 40% retained CC	helicopter	defer	
30-1c	351*	25	CHU	NDNM/Fuels	-----	NDNM/Fuels	-----
Late Successional Reserve							
Unit	ACRES	Stream Buffer	Spotted owl CHU OR-32	Alternative 2		Alternative 3	
				RX	YARDING	RX	YARDING
25N-1	31	60	CHU	CDM 30-40% retained CC	cable	CDM 30-40% retained CC	cable
25N-2a	15	60	CHU	CDM 30-40% retained CC	Tractor/cable	CDM 30-40% retained CC	Tractor/cable
25N-2b	7	25	CHU	NDNM	-----	NDNM	-----
25N-3	44	60	CHU	CDM 30-40% retained CC	cable	CDM 30-40% retained CC	cable
25N-4	2	No riparian present	CHU	CDM (right-of-way)	Tractor/shovel	CDM (right-of-way)	Tractor/shovel
27-1	25	25 from top of draw	CHU	CDM 40-60% retained CC	tractor	CDM 40-60% retained CC	tractor
28-1	14	60	CHU	CDM/ Smallwood 50-60% retained CC	cable	CDM/ Smallwood 50-60% retained CC	cable
34-1	37	60	CHU	CDM/ Smallwood 50% retained CC	cable	CDM/ Smallwood 50% retained CC	cable
1-1a	32	90	CHU	CDM 40% retained CC	Cable swing (Tractor for ridge)	CDM 40% retained CC	Cable swing (Tractor for ridge)
1-1b	19	25	CHU	NDNM	-----	NDNM	-----

Late Successional Reserve (continued)							
Unit	ACRES	Stream Buffer (ft)	Spotted owl CHU OR-32	Alternatives 2		Alternative 3	
				RX	YARDING	RX	YARDING
1-3a	4	25 from top of draw-stream at north end of unit	CHU	CDM 40-50% retained CC	Downhill cable	CDM 40-50% retained CC	Downhill cable
1-3b	11	150	CHU	CDM 40-50% retained CC	Downhill cable	CDM 40-50% retained CC	Downhill cable
1-3c	3	90 (lesser slope in this area)	CHU	CDM 40-50% retained CC	cable	CDM 40-50% retained CC	cable
1-3d	<1	150	CHU	CDM 40-50% retained CC	Cable/shovel	CDM 40-50% retained CC	cable
1-3e	38	25	CHU	NDNM	-----	NDNM	-----
1-4	18	150	CHU	CDM 60% retained CC	cable	CDM 60% retained CC	cable
3-1a	8	60	CHU	CDM 30-40% retained CC	cable	defer	
3-1b	8	25	CHU	NDNM	-----	NDNM	-----
3-2	24	25	CHU	NDNM	-----	NDNM	-----
3-3	2	25	CHU	NDNM	-----	NDNM	-----
11-1	29	60	CHU	CDM 60% retained CC	Tractor/cable	CDM 60% retained CC	Tractor/cable
13-1a	13	90	CHU	CDM 40-50% retained CC	cable	defer	
13-1b	24	25	CHU	NDNM	-----	NDNM	-----
13-2x	38	25	CHU	NDNM	-----	NDNM	-----
13-2e	3	125	CHU	CDM 40-50% retained CC	Tractor	CDM 40-50% retained CC	Tractor
13-2f	3	125	CHU	CDM 40-50% retained CC	Tractor/cable	CDM 40-50% retained CC	Cable
19N-2	34	60	CHU	CDM 30-40% retained CC	cable	CDM 30-40% retained CC	cable

Late Successional Reserve (continued)							
Unit	ACRES	Stream Buffer (ft)	Spotted owl CHU OR-32	Alternatives 2		Alternative 3	
				RX	YARDING	RX	YARDING
19N-3a	15	60	CHU	CDM 30-40% retained CC	cable	CDM 30-40% retained CC	cable
19N-3b	8	25	CHU	NDNM	-----	NDNM	-----
19N-6	9	25	CHU	NDNM	-----	NDNM	-----
19N-7	2	No riparian present	CHU	CDM (Right-of-way)	Tractor/shovel	CDM (right-of-way)	Tractor/shovel
29-2a	35	90	CHU	CDM 40-60% retained CC	cable	defer	
7-1	78	25		NDNM	-----	NDNM	-----
7-2	22	90		CDM 40-50% retained CC	cable	CDM 40-50% retained CC	cable
17-1a	16	125		CDM 40-50% retained CC	Tractor	CDM 40-50% retained CC	Tractor
17-1b	29	25		NDNM	-----	NDNM	-----
18-1a	11	125		CDM 40-50% retained CC	Tractor/cable	CDM 40-50% retained CC	Tractor/cable
18-2	19	125		CDM 40-50% retained CC	cable	defer	
18-3	33	25		NDNM	-----	NDNM	-----
19S-1	44	25	CHU	NDNM	-----	NDNM	-----

* Unit 30-1c contains 273 acres in Evans Creek fifth-field watershed, within the Butte Falls Resource Area. All other treatments are located in the Upper Cow Creek watershed, within the Glendale Resource Area.

Legend

CHU = Critical Habitat Unit

RH = Regeneration Harvest

OR = Overstory Removal

CT = Commercial Thin

NDNM = Non-commercial density management

CDM = Commercial density management

Table 2-2. Comparison of Fuels Reduction Treatments

UNIT	Fuels Treatments	
	Alt 2	Alt 3
Matrix		
29-1	S,H,HPB,UB	S,H,HPB,UB
29-3	S,H,HPB,UB	S,H,HPB,UB
6-3	S,H,HPB	NA
30-1a	H,HPB	NA
30-1b	H,HPB	NA
30-1c	S,H,HPB,UB	S,H,HPB,UB
Late Successional Reserve		
25N-1	L&S,S,H,HPB,UB	L&S,S,H,HPB,UB
25N-2a	L&S,S,H,HPB,UB	L&S,S,H,HPB,UB
25N-2b	L&S,S,H,HPB,UB	L&S,S,H,HPB,UB
25N-3	S,H,HPB	S,H,HPB
25N-4	L&S,S,H,HPB,UB	L&S,S,H,HPB,UB
27-1	S,H,HPB	S,H,HPB
28-1	L&S,S,H,HPB,UB	L&S,S,H,HPB,UB
34-1	L&S,S,H,HPB,UB	L&S,S,H,HPB,UB
1-1a	L&S,S,H,HPB,UB	L&S,S,H,HPB,UB
1-1b	L&S,S,H,HPB,UB	L&S,S,H,HPB,UB
1-3a	L&S,S,H,HPB,UB	L&S,S,H,HPB,UB
1-3b	L&S,S,H,HPB,UB	L&S,S,H,HPB,UB
1-3c	L&S,S,H,HPB,UB	L&S,S,H,HPB,UB
1-3d	L&S,S,H,HPB,UB	L&S,S,H,HPB,UB
1-3e	L&S,S,H,HPB,UB	L&S,S,H,HPB,UB
1-4	L&S,S,H,HPB,UB	L&S,S,H,HPB,UB
3-1a	H,HPB	NA
3-1b	L&S,S,H,HPB,UB	L&S,S,H,HPB,UB
3-2	L&S,S,H,HPB,UB	L&S,S,H,HPB,UB
3-3	L&S,S,H,HPB,UB	L&S,S,H,HPB,UB
11-1	L&S,S,H,HPB,UB	L&S,S,H,HPB,UB
13-1a	L&S,S,H,HPB,UB	NA
13-1b	L&S,S,H,HPB,UB	L&S,S,H,HPB,UB
13-2x	L&S,S,H,HPB,UB	L&S,S,H,HPB,UB

Late Successional Reserve		
13-2e	L&S,S,H,HPB,UB	L&S,S,H,HPB,UB
13-2f	L&S,S,H,HPB,UB	L&S,S,H,HPB,UB
19N-2	L&S,S,H,HPB,UB	L&S,S,H,HPB,UB
19N-3a	S,H,HPB	S,H,HPB
19N-3b	L&S,S,H,HPB,UB	L&S,S,H,HPB,UB
19N-6	L&S,S,H,HPB,UB	L&S,S,H,HPB,UB
19N-7	L&S,S,H,HPB,UB	L&S,S,H,HPB,UB
29-2a	L&S,S,H,HPB,UB	NA
7-1	L&S,S,H,HPB,UB	L&S,S,H,HPB,UB
7-2	S,H,HPB	S,H,HPB
17-1a	S,H,HPB	S,H,HPB
17-1b	L&S,S,H,HPB,UB	L&S,S,H,HPB,UB
18-1a	L&S,S,H,HPB,UB	L&S,S,H,HPB,UB
18-2	L&S,S,H,HPB,UB	NA
18-3	L&S,S,H,HPB,UB	L&S,S,H,HPB,UB
19S-1	L&S,S,H,HPB,UB	L&S,S,H,HPB,UB

* Units would be re-evaluated prior to fuels reduction treatment to determine if the prescribed treatment is still appropriate given the current, post-harvest unit conditions.

Legend

S = slash H= handpile HPB= handpile burn UB = underburn
L&S = lop & scatter

Table 2-3. Proposed Road Maintenance in the Slim Jim Project Area

Road Number/Seg	Length (miles)	Control	Surfacing	TMO
31-3-19	0.3	BLM	nat	2
31-3-29 Seg. A	1	BLM	nat	1
31-3-31 Seg. A	1.8	BLM	pr	2
31-3-31 Seg. B	2.08	BLM	pr	2
31-3-31.1 Seg. B	0.4	BLM	nat	1
31-3-32	Tie rd	Private	nat	
31-3-32 Seg. A	1.42	Private	nat	
31-4-25 Seg. A	0.13	BLM	pr	2
31-4-25 Seg. B	0.57	Private	pr	

Road Number/Seg	Length (miles)	Control	Surfacing	TMO
31-4-25 Seg. C	1	Private	pr	
31-4-25.3	0.48	BLM	pr	2
31-4-27 Seg. B	0.75	BLM	asc	2
31-4-27C	2.40	BLM	abc	2
31-4-34	1.55	BLM	pr	2
32-3-5 Seg. A	2.35	BLM	bst	5
32-3-5 Seg. B	1.2	BLM	Bst	5
32-3-6	0.45	BLM	abc	2
32-3-7A	1.67	BLM	abc	2
32-3-7B1	1.07	BLM	nat	2
32-3-7B2	0.7	BLM	nat	2
32-3-7.2	1.23	BLM	abc	2
32-3-18	0.85	BLM	abc	2
32-3-18.1A1	0.2	BLM	abc	2
32-3-19.1	0.4	BLM	asc	3
32-3-19.11	0.69	BLM	abc	1
32-3-19.8	0.12	BLM	abc	2
32-4-1A	2.52	BLM	asc	2
32-4-1B	1.36	BLM	nat	2
32-4-1.2A	0.34	BLM	nat	1
32-4-1.2B	1.07	BLM	nat	1
32-4-1.3	0.68	BLM	nat	1
32-4-3A	0.01	BLM	pr	2
32-4-3.1	0.29	BLM	pr	2
32-4-4A	0.75	BLM	asc	3
32-4-9A	5.04	BLM	asc	2
32-4-11.2	0.1	BLM	pr	2
32-4-12.1A	0.9	BLM	pr	2

Legend

nat = Native
pr = Pit Run Rock
asc = Aggregate Surface Course
bst = Bituminous Surface Treatment

Table 2-4 Temporary Use Roads, New Construction, Road Blocking, and Decommissioning

Temporary use of existing roads		Remove barricade spur road into #32-4-1 rd into Unit 1-4; then replace barricade.
		Remove barricade at #32-4-1.3 rd into Unit 1-1a; then replace barricade.
		Remove barricades at #32-4-11.2 rd & #32-4-11.1 into Unit 11-1; then replace barricades.
		Remove barricade at #32-3-6 rd into Unit 6-3; then replace barricade.
		Remove barricade at #32-3-19.11 rd for helicopter landing use; then replace barricade.
		Remove barricade spur road into #32-3-18 rd into Unit 18-2; then replace barricade.
		Open spur road #31-4-27 rd into Unit 27-1; add barricade after use.
		Open road #31-4-27.3 into Unit 27-1
New construction	Temporary	0.28 mi. Unit 3-1; Block, rip, mulch after use.
		0.20 mi. Unit 13-1a; Block, rip, mulch after use.
		0.20 mi. Unit 18-2; 2 spurs; Block, rip, mulch after use.
		0.20 mi. Unit 29-2a; 2 spurs; Block, rip, mulch after use.
Block/Gate (New)	Road #32-3-20.1	Outside of treatment unit. Gate or barricade, *0.54 mi.
	Road #31-3-31.1	Outside of harvesting unit; within hazardous fuels reduction unit (29-3). Partial block: gate or barricade at junction of the #31-3-29 rd, *0.70 mi
	Road # 31-3-29.1	Outside of harvesting unit; within hazardous fuels reduction unit (29-1). Partial block: gate or barricade at junction of the #31-3-29-32 rd, * 0.50 mi
Decommissioning (as funding available)	Road # 32-3-19	Partial Dec. of Road # 32-3-19; road barricaded, * 0.50 mi; trees growing back; reclaimed. Outside of treatment units.
	Road # 32-3-19.3	Dec. last segment of Road # 32-3-19.3; road barricaded, pull pipe(s), rip road, & mulch. * 0.30 mi; shows closed but is driveable. Outside of treatment units.

* dependent on available funding

Table 2-5. Forest Treatment Summary

Matrix		
	Alt.2 Proposed Action	Alt. 3
Number of units	6	3
Acres of RH/OR	29	0
Acres of NDNM/fuels	586	586
Acres of CT	28	0
Total treatment acres in Matrix	643	586
Acres of tractor	0	0
Acres of cable	16	0
Acres of helicopter	41	0
Roads		
• decommission	0	0
• block/gate	1.20	1.20
• maintenance	5.3	2.8
• new temp	0	0
Late Successional Reserve		
	Alt.2 Proposed Action	Alt. 3
Number of units	40	37
Acres of CDM	447	356
Acres of NDNM	361	361
Total treatment acres in LSR	808	717
Acres of tractor	53	53
Acres of cable	394	303
Acres of helicopter	0	0
Roads (mi.)		
• decommission	0.80	0.80
• block/gate	0.54	0.54
• road maintenance	29	27.8
• new temp	0.88	0

RH/OR = Regeneration Harvest/ Overstory Removal

CDM = Commercial Density Management

NDNM = Non-commercial Density Management

CT = Commercial Thin

2.3 Project Design Features

Project Design Features (PDFs) are specific measures included in the design of the action alternatives to minimize adverse impacts on the human environment. Many of the PDFs are contained under Best Management Practices (BMP), Appendix D, in the Resource Management Plan (RMP) and are repeated for ease of fully understanding the project.

2.3.1 Smoke Management

All prescribed burning would be managed in a manner consistent with the requirements of the Oregon Smoke Management Plan and the Department of Environmental Quality's Air Quality and Visibility Protection Program.

The operational guidance for the Oregon Smoke Management Program is managed by the Oregon State Forester.

2.3.2 Fuel Treatments

Prescribed fire plans are prepared for all burning activities. The plans are designed to ensure that resource and fire management objectives are met by setting parameters under which the burning may take place. Prescribed burning would be conducted in a manner that would minimize damage to reserve trees, duff, and soil, and to avoid loss of large, coarse woody debris.

Piles would be burned in the fall to winter season after one or more inches of precipitation have occurred. This would reduce the potential for fire spread and scorch and mortality to the residual trees and shrubs. High soil and duff moisture would also prevent soil damage from burning. Patrol and mop-up of burning piles would occur when needed to prevent treated areas from reburning or becoming an escaped fire. The timing of prescribed burns depends on these parameters and the availability of adequate fire suppression resources as a contingency plan in the event of escaped fire.

Landing piles would be burned, if necessary, on all harvest units. Specific adjustments to planned fuels treatments would require Field Manager approval.

2.3.3 Cultural

Although surveys in the Slim Jim Planning Area revealed no cultural sites, it is always possible that through subsequent activities on the ground a site may be uncovered. All such sites would be evaluated and protected by the BLM under the following Federal laws: Federal Land Policy and Management Act of 1976, National Historic Preservation Act (Section 106) of 1966, Antiquities Act of 1906, Archaeological Resource Protection Act of 1979, Reservoir Salvage Act of 1960, American Indian Religious Freedom Act of 1978, National Environmental Policy Act of 1960, and Native American Graves Protection and Repatriation Act of 1990.

Adverse effects to archaeological/historical sites are most easily mitigated through site avoidance. Should avoidance be impracticable, then the affected site would need to be formally evaluated and impacts to them may need to be mitigated through further study.

2.3.4 Visual Quality

Unit 28-1: VRM Class II: Unit is located directly on the Reservoir. Retain a 50% canopy on the flatter sections near the Reservoir with a feathering of more dense leave trees along the shore of the reservoir. Retain a 60% canopy throughout the more steep sections of the unit. Use alternative harvest methods including, but not limited to, “Zig Zag”, or “Chute” system harvest methods to minimize visual impacts. Leave as much vegetation as feasible along the downhill side of the 31-4-34 road on the upper most border of the unit to block the view from the reservoir of constructed landings, and road cut-banks.

Unit 34-1: VRM Class II: Retain a 50% canopy throughout the unit. Leave the trees on the ridgeline in their current state, if feasible, and feather treatment downslope. Use a “Chute” harvest system, or similar method of harvest, so as to not leave noticeable yarding corridors, throughout the unit.

Unit 27-1: VRM Class II: Logging equipment should not be located directly on the Cow Creek Road. Yarding corridors should not be seen from the Cow Creek Road or the Galesville Reservoir. Retain an average of 40-60% canopy throughout the unit with more dense buffers on the upper edges and directly along Cow Creek Road. If landings are located adjacent to the Cow Creek Road take every precaution to leave as much vegetation as possible between the landing and the Cow Creek Road and re-vegetate the landing immediately following harvest operations if feasible.

All Other Units: VRM Class III & IV: Every attempt should be made to minimize the effect of activities through careful location, minimal disturbance, and should repeat the basic elements of form, line, color, and texture.

2.3.5 Vegetation

Heavy equipment would be washed before initial move-in and prior to all subsequent move-ins into the Planning Area to remove soil and plant parts to prevent the spread of invasive and noxious weeds.

Only logging and construction equipment inspected by the BLM would be allowed to operate within the project area, or in the immediate vicinity of the project area. All subsequent move-ins of logging and construction equipment would be treated the same as the initial move-in.

Cleaning shall be defined as removal of dirt, grease, plant parts, and material that may carry noxious weed seeds and parts onto BLM lands. Cleaning prior to entry onto BLM lands may be accomplished by use of a pressure hose.

Logging and construction equipment would be visually inspected by a qualified BLM specialist to verify that the equipment has been cleaned.

Areas disturbed by temporary road construction and use as well as areas along roads that have been burned will be planted with a native grass and forb seed mix (if available) or other grass mix.

Trees 20 inches and larger dbh would be designated as reserve trees within LSR units and would not be cut as part of density management operations. Trees 20 inches and larger dbh if felled for safety reasons or accidentally knocked over would be left on site.

2.3.6 Streams and Riparian Zones

On all units, a minimum 25 foot no treatment buffer, from bankful width, would be used to protect streambank stability. Studies have shown that “vegetation immediately adjacent to the stream channel is most important in maintaining bank integrity” (FEMAT 1993). Twenty-five feet is roughly equal to the largest crown width that is generally present on trees occurring within riparian stands that have been chosen for treatment under this project. For Douglas fir trees typical of these stands, crown width generally relates to the extent of the root network (Kocher) that is helping to stabilize the streambanks. In addition to the stabilizing effect of the root network, adjacent trees also dissipate stream energy during high or overbank flows, further reducing bank erosion (FEMAT 1993).

For streams within commercial density management units, an additional stream no treatment buffer of variable width would be utilized. The buffer distance used would be between 60 and 150 feet (see table 2-1), and was determined based on the Ecological Protection Width Needs chart (B-15, Standards and Guidelines).

On streams within young, dense stands designated as fuels and non-commercial density management units, no timber harvest yarding would occur. Excess trees less than 10 inches at breast height would be felled or girdled. Within the estimated 60’ buffer that is needed to protect shade characteristics (NWFP Temperature TMDL Implementation Strategies, US Forest Service and BLM, 2005), angular canopy density would remain close to existing levels to protect stream shading. Trees and created slash would be treated within this area (outside the 25’ no treatment buffer discussed above) to reduce fire hazard and to improve the vigor of the remaining overstory trees by increasing available growing space, water, and nutrients.

For streams within commercial density management units, an additional stream buffer of variable width would be utilized. The buffer distance used would be between 60 and 150 feet, and was ultimately designated based on the Ecological Protection Width Needs chart (B-15, Standards and Guidelines). This chart is based on slope and rock type, and takes into account protection of streams from “surface erosion of streamside slopes, fluvial erosion of the stream channel, soil productivity, habitat for riparian-dependent species, the ability of streams to transmit damage downstream, and the role of streams in the distribution of large wood to downstream fish bearing waters” (B-15, Standards and Guidelines). Also included within this buffer is full protection of the primary shade zone, as described in the NWFP Temperature TMDL Implementation Strategies (US Forest Service and BLM, 2005), and sufficient canopy

closure within the secondary shade zone to maintain or improve microclimate conditions within the riparian zone in the long term, without measurably increasing stream temperatures in the short or long term.

Unit 6-3 is the only unit on Matrix lands designated for commercial harvest (in Alt 2 only) that is known to have an intermittent or perennial stream. This stream would receive a full NWFP designated no harvest buffer of 170 feet (one potential tree height). It was determined by the ID team that treatment of the riparian reserve within this unit is not needed at this time because these trees are of an older age class and the stand is already on a trajectory to achieve late successional characteristics desired within federally managed riparian reserves.

Springs, slumps, unstable, or wet areas found during layout would be buffered in accordance with the buffer widths that have been designated for the streams within that unit.

Any commercial removal of materials from units with granitic soils would not occur within 100 feet of the stream bank.

Trees in no-harvest portions of riparian reserves that are accidentally knocked over during falling and yarding would be retained on site for fish /wildlife habitat or would be treated with activity fuels.

Helicopter refueling sites would not be located within Riparian Reserves.

Helicopter landings would be constructed and used in the same season if possible. If they are to be left over winter, the landings would be mulched to prevent erosion. Landings would be ripped after logging and mulch or planted with seedlings. Helicopter landings would only be rocked if necessary to prevent erosion and sedimentation into the streams.

2.3.7 Yarding of Timber

Tractor and cable yarding on all density management units would not be allowed between March 1 and June 1 to prevent damage of bark slippage on residual trees.

Tractor yarding would be allowed between May 15 and October 15 (during the dry season, typically) of the same year to minimize the amount of soil disturbance and compaction. If soils are sufficiently dry outside this season, tractor yarding may be allowed if approved by the Field Manager.

Old skid trails would be used whenever practical, and new skid trails would be placed at least 150 feet apart, where topography allows to reduce the amount of compaction within tractor yarded units. New skid roads would be pre-designated and approved by the Authorized Officer. Total compaction would not exceed 12 percent of harvested area within any unit.

Yarding tractors would not exceed nine feet in width and would be equipped with an integral arch to minimize soils disturbance and compaction.

To minimize soil disturbance the use of blades while tractor yarding would be permitted and would walk over as much ground litter as possible to reduce compaction and keep soil organics on site.

When possible, tractor yarding would use existing skid roads. New skid roads would be pre-designated and approved by the Authorized Officer.

Native grass/forb seeding, mulching or hay bale placement would be used, where needed, as needed to minimize surface erosion, and reduce stream sedimentation.

Existing conifer regeneration would be protected during tractor yarding operations.

Partial suspension (at a minimum) would be required on all cable units to minimize soil disturbance. Full suspension would be required if yarding needed to cross streams, wet, or unstable areas.

Cable yarding lines would be respooled when changing yarding corridors.

The number of yarding corridors would be minimized to reduce soil compaction from cable yarding. Corridors would be located approximately 150 feet apart at the tail end.

Lateral yarding would be required on all units to protect residual leave trees and existing conifer regeneration. Yarding carriages would be required to maintain a fixed position during lateral yarding to reduce damage to the residual stand.

All trees to be yarded in cable units would be limbed and cut into lengths not to exceed 41 feet prior to yarding to minimize damage to residual trees.

Directional falling away from streams would be required within one tree length of all riparian areas.

Hardwoods not designated for cutting within treatment units would be reserved and to the extent possible would not be cut during falling and yarding operations.

Yarding would be completed within one month of falling in OR units to minimize damage to conifer regeneration.

Directional falling toward the lead would be required on cable yarded units to minimize damage to residual (reserve) trees.

In OR harvest units, trees would be felled away from residual conifer regeneration.

Unit layout would restrict tractor yarding to slopes less than 35% in order to prevent excessive soil disturbance.

Where width of the trail would allow, skid trails within tractor units would be discontinuously subsoiled preferably with winged ripper teeth, seeded, water-barred, mulched, and blocked during dry soil conditions, upon completion of current harvest. Where trail width would not accommodate the size equipment needed to use the winged ripper teeth, or where unacceptable damage to residual trees would result, a standard surface scarifier, or ripper would be used in place of the winged ripper. These trails would be planted, water-barred, mulched, and blocked. Water bars would be installed at the same time as sub-soiling/ripping, unless skid road would be needed to complete harvest the following season. In this case, water-bars would be constructed and mulch would be applied to exposed soil prior to falls rains to reduce sedimentation during winter months. Water bar spacing on tractor skid trails would be based on the NWFP Standards and Guidelines erosion control measures for timber harvest which considers slope and soil series (S&G, p. 167).

Rural residents would be notified of helicopter flight patterns if activities are located within ¼ mile of residential lands.

2.3.8 Roads

Where practical, temporary roads would be constructed without using tractor blades. These roads where possible, would be cleared of debris enough to allow access, without disturbing the root mass.

Trees larger than 20” in the LSR that would be cut for the construction of temporary roads or logging tower locations in the late successional reserve would be retained and placed downslope to augment coarse woody debris levels.

Temporary roads and helicopter landings would be winterized with water bars, berms, dikes, dams, sediment basins, gravel, or mulched as needed. “Winterize” is the process that minimizes the amount of erosion which will take place before disturbed soil and new surfaces stabilize.

Temporary spur roads and landings built would be decommissioned after use. This would involve discontinuous sub-soiling (Davis, pp. 138 & 139) with winged rippers, mulching, pulling culverts, water-barring and barricading, and planting with conifer seedlings, and/or native grass/forbs mixtures.

To reduce erosion and stream sedimentation, temporary road construction, road decommissioning, and log hauling on natural surface roads and roads with less than 8” of existing rock surfacing, would generally only be allowed between May 15 and October 15 of the same calendar year. Additionally, if wet weather conditions occur during this period, log haul may be suspended on roads with either erosive surfaces or poor drainage that has caused, or would cause during use, the occurrence of saturated or “soupy” road surfaces that would result in excessive mud splash, tire slide, or rutting; or any condition that would result in water being

perpetually re-routed into tire tracks or away from designed drainage patterns. The Field Manager may approve a provisional off-season log hauling agreement, if dry weather and soil conditions exist during the restricted hauling season. The purchaser would be required to request the off-season log haul from the Field Manager in writing.

Hauling on paved roads or roads with 8" or more rock surfacing would generally be approved for year-round hauling.

Surface area of erodible earth exposed at any one time by stump removal and excavation would not exceed 2 acres after September 15 to avoid excessive erosion during fall rains.

Energy dissipaters and down spouts would be installed at cross-drain and stream culverts, where necessary, to protect road fill slopes that are not adequately protected by natural materials.

Road cuts, fill slopes, borrow material and other bare ground disturbed by road construction activities would be mulched and seeded prior to autumn rains (about the first week in October).

Landings would be located in approved sites and designed with adequate drainage. Helicopter landings would be constructed and used in the same season. Step landings would be re-contoured following use. All other landings would be sub-soiled following logging and planted with conifers. Exceptions would be where landings utilize existing road prisms, in which case the original roads would not be sub-soiled or planted. Dust abatement on landings would include rocking and/or applying lignin. Adequate drainage would be provided to minimize erosion. Helicopter landings would only be rocked if it is necessary to prevent erosion and stream sedimentation.

Hydraulic fluid and fuel lines on heavy mechanized equipment would be in proper working condition in order to minimize potential for leakage into streams. No re-fueling of any equipment would occur within 150 ft of streams or stream crossings.

Logging, burning and other activities would be designed and implemented so that traffic on the McGinnis Creek Road (#31-4-27) and the Snow Creek Road (#32-3-5) would not be blocked for more than 30 minutes at a time.

In residential areas and along haul routes near Galesville Reservoir use dust abatement measures (such as watering roads) on all non-paved roads associated with the proposed activities. These areas include; the 31-3-31.2 road, 31-4-27 road, and the 31-4-1 road at their junctions with the Cow Creek Road (County Rd 36). Dust abatement would occur on these non-paved roads for approximately $\frac{1}{8}$ – $\frac{1}{4}$ of a mile beginning at the junction of County Rd. 36, near these mentioned areas.

Notification would be made to area residents of increased truck traffic in high recreational use areas along Cow Creek and Snow Creek Roads and residential areas. Signs would be posted along rural bus stops during school attendance months.

2.3.9 Special Status Species and their Habitats

Northern Spotted Owl

Any of the following PDFs may be waived in a particular year if nesting or reproductive success surveys conducted according to the U.S. Fish and Wildlife Service (USFWS) - endorsed survey guidelines reveal that spotted owls are non-nesting or that no young are present that year. (USDI/USFWS 2003 BO, p. B-22). Waivers are valid only until March 1 of the following year. Previously known well established sites/activity centers are assumed occupied unless protocol surveys indicate otherwise.

As cited in the 2003 BO (Biological Assessment, p. BA-21) , work activities (such as tree felling, yarding, road construction, hauling on roads not generally used by the public, and prescribed fire) would not be permitted within specified distances (see Table 2-6), of any nest site or activity center of known pairs and resident singles between March 1 and 30 June (or until two weeks after the fledging period) – unless protocol surveys have determined the activity center to be not occupied, non-nesting, or failed in their nesting attempt. March 1 – June 30 is considered the critical early nesting period.

The action agency biologist has the option to extend the restricted season to as late as 30 September during the year of harvest, based on site-specific knowledge (such as a late or recycle nesting attempt). The restricted area is calculated as a radius from the assumed nest site (point). See Appendix F of the Assessment for a discussion of the rational for the 30 June restriction date.

Table 2 - 5. Seasonal Restrictions for Spotted Owls

Type of Activity – for Spotted Owl	Zone of Restricted Operation
Impact pile driver, jackhammer, or rock drill	180 feet
Helicopter or single-engine airplane	360 feet
Chainsaws (hazard trees, tree harvest, etc.)	195 feet
Heavy equipment	105 feet

(II) During helicopter operations, flights over suitable habitat would be restricted (helicopter should be a least 120 yards above ground level) (USDI/USFWS 2003 BO, Appendix A p. 11).

Bald Eagle

Work or other activities above ambient noise levels that cause disturbance, including logging and hauling, would not take place within 0.25 mile (approximately 400 m) of active nests/roosts (not line of site) or within 0.5 mile (approximately 800 m) (line-of-sight) from nests/roosts during periods of eagle use, unless surveys demonstrate that the nest or roost is not being used, or use of

the site has ended for the year. Critical nesting periods generally fall between 1 January and 31 August. However, the work restriction window can be ended two weeks after chicks have fledged, if known.

2.3.10 Snags and Down Logs

The Northwest Forest Plan ROD Standards and Guidelines (p. C-40) recognized the need for specific coarse woody measures to be developed. As such, all regeneration and overstory removal harvest units would be guided by the “Guidelines for Snag and Down Wood Prescriptions in Southwestern Oregon” (USDA 2000). All non-hazardous snags would be retained in all harvest units. If it is necessary to fall snags for safety reasons, they would remain on site as down wood. All existing naturally occurring dead and down woody debris, greater than or equal to 16 inches diameter, would remain on site.

Chapter 3.0 Affected Environment and Environmental Consequences

3.1 Introduction

In accordance with law, regulation, executive order, policy and direction, an interdisciplinary team reviewed the elements of the human environment to determine if they would be affected by the alternatives described in Chapter 2.0. Those elements of the human environment that were determined to be affected define the scope of environmental concern (**see Environmental Elements in Appendix 2 for full list of elements considered**). The Affected Environment portion of this chapter describes the current conditions and how they came to be. The relevant resources that could be potentially impacted are: affects to **fire risk; special status wildlife species and critical habitat; and soils and water quality** as the result of management activity.

Current conditions in the project area result from a multitude of natural events and human actions that have taken place over many decades. Cumulative effects are defined as the, “impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions” (40 CFR § 1508.7). A description of current conditions inherently includes the effects of past actions and serves as a more accurate and useful starting point for a cumulative effects analysis than by “adding up” the effects of individual past actions. “Generally, agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions.” (CEQ Memorandum ‘Guidance on the Consideration of Past Actions in Cumulative Effects Analysis’ June 24, 2005.) Cataloguing past projects and their individual effects would not be useful in discerning the contribution of the incremental impact of the project’s action alternatives. However, cataloguing and analyzing other present and reasonably foreseeable actions relevant to the effects of the proposed action *is* necessary and is described below. By comparing the “no action” alternative (current condition) to the action alternatives, we can discern the “cumulative impact” resulting from adding the “incremental impact” of the proposed action to the current environmental conditions and trends.

Scoping for this project did not identify a need to exhaustively list individual past actions or analyze their environmental effects in order to fully analyze the effects, including cumulative, of this project’s action alternatives. No individual past actions have been identified that would have a cause-and-effect relationship with the Slim Jim proposals.

3.2 Fire Risk

3.2.1 Affected Environment

Fire Risk

The Planning Area is within the Klamath Province Region of Southwestern Oregon. Fire is recognized as a key natural disturbance process throughout Southwestern Oregon because it influences successional processes and creates diverse forest conditions (Atzet and Wheeler 1982).

Prior to the 20th century, low-severity fires burned frequently in dry forest ecosystems indicative of Southwestern Oregon. Ignitions were caused by both lightning and humans. Low-severity fires controlled the regeneration of fire-intolerant species (plants unable to physiologically withstand heat produced by fires), promoted fire-tolerant species, maintained an open forest structure, reduced forest biomass, decreased the impacts of insects and diseases, and maintained wildlife habitat for many species that utilize open stand structures (Graham, R.T. et al, 2004). Native Americans influenced vegetation patterns for over a thousand years by igniting fires to enhance values that were important to their culture, such as improving hunting grounds and maintaining travel routes (Pullen, 1995). Early settlers to this area used fire to improve grazing and farm land and to expose rock and soil for mining. Large, low to moderate severity fires were a common occurrence in the area, evidenced by fire scars and current vegetative patterns.

Fire suppression efforts began in the early 1900s, but effective suppression in the area did not occur until after World War II with the advent of roads into the area and the assignment of adequate firefighting personnel and equipment. The absence of fire due to aggressive suppression efforts in recent decades has promoted a shift to more shade tolerant, fire-prone species while fire-resilient species have decreased (Atzet, 1996). Also, stands which were once open are now overstocked with conifers, small hardwoods, and brush, which have changed the horizontal and vertical structure of the stands. Increased stand densities result in trees becoming weakened, rendering them more susceptible to drought, insects, and disease. Higher stand densities with excessive ladder fuels, surface fuels, and aerial fuels (crown density) burn more intensely and with a greater degree of severity.

Before the implementation of the Northwest Forest Plan (NFP, 1995), Riparian Reserves had not been established and harvesting treatments on uplands frequently continued through riparian areas. As a result, many riparian areas were clearcut. As the stands began to regenerate, the single aged vegetation developed into dense and brushy single storied stands. Such conditions, pose a fire risk especially in combination with steep side channels and terrain. Riparian areas with these conditions create a chimney effect when ignited. Flames quickly funnel up slopes and across the landscape. Re-establishing stands with small trees continue to be a fire risk until the stand develops into an older age class (stands approximately greater than 80 years of age) where shading is present, trees increase significantly in size, and vertical diversity and stand height increases. The Upper Cow Creek Watershed Analysis notes that 45% (1,529 acres) of Riparian Reserves within the BLM portion of the fifth-field watershed contain stands less than 80 years of

age.

Fire risk reflects the probability of ignition within a given area. Increasing development of homes in the wildland urban interface, trail systems, dispersed camp sites, recreational use, and major travel corridors all serve to increase the risk of a fire occurring from human causes. Fires most frequently occur between July through September when conditions tend to be the driest and most flammable.

Information from the Oregon Department of Forestry database from 1967 to 2003 show that a total of 48 fires occurred in the Upper Cow Creek Watershed project area which burned a total of 2,457 acres. Lightning accounted for 42 percent of the total fires while human-caused fires accounted for 57%. The following table (Table 3-1) is a break-down of the fires within the fifth-field watershed.

Table 3-1. Fire History in the Upper Cow Creek Watershed

Total Number of Fires	Size Class
32	A (<.25 ac)
9	B (.26-10 ac)
3	C (10.1-100 ac)
3	D (100.1-300 ac)
1	F (1000-4999 ac)

3.2.2 Environment Effects

3.2.2.1 No Action

The current trend of increasing stand densities would continue. The average return interval for low-severity fire regime stands would increase because, without thinning treatments, prescribed fire cannot be safely re-introduced into the Planning Area. Fire suppression would continue because there are no policies in place, or being proposed, that would allow wildfires to burn naturally within the Planning Area. As fire is continually excluded, the risk of catastrophic wildfire behavior increases.

3.2.2.2 Action Alternatives (2 and 3)

These alternatives would decrease wildfire intensity and behavior by reducing overall stand densities within the timber stands proposed for treatment. By altering fire behavior, the duration of a fire and the amount of acres burned in high intensity fires would be reduced. This change in fire behavior would reduce the mortality of conifers in the event of a wildfire.

The existing surface fire behavior fuel model in the majority of stands proposed for commercial-harvest are represented by a Timber Group fire behavior fuel model. In the short term (10 to 25 years), harvest action would create surface fuels which would be greater in most areas than current levels, if they are not treated. Fuel amounts are measured in tons per acre for different sizes of material. Material up to 3 inches in diameter has the greatest influence on the rate of spread and flame length of a fire, which has direct impacts on fire suppression efforts. It is anticipated that fuel loadings after logging increase by approximately 3 to 15 tons per acre. This would change the existing fuel model of most of the timbered stands to a Logging Slash Group, which in turn would create higher rates of spread and greater flame lengths in the event of a wildfire. Until the logging slash is treated (typically six months to a year after commercial-harvest activity) there would also be an increase in the duration and intensity of a ground fire, should one occur. This would cause increased mortality to the smaller diameter overstory trees. To mitigate the impacts of residual activity slash on the fuel hazard of the commercial-harvest units, fuels created by the harvest activity would be treated on all the acres harvested under this proposed project.

Thinning treatments increase fire resiliency of timbered stands by reducing tree density, removing ladder fuels, and focusing on smaller diameter trees for removal. Thinning is also necessary before returning fire to the site in the form of prescribed fire. Thinning within the Riparian Reserve would expedite the development of late successional, multi-story habitat conditions and “restore the species composition and structural diversity of the plant communities”, needed to achieve ACS and riparian reserve objectives (Medford RMP, pg 22 & 26).

Access to an area plays a critical role in determining if fuels treatments can occur. Risk of escaped prescribed fire does exist, but is mitigated by implementing treatments during the proper soil and duff moisture conditions, as well as by patrolling and mopping-up after the treatment. Without road access, the risk of escape increases due to the lack of availability and mobility of personnel, equipment, and water. Limited or no access would preclude the use of prescribed underburning.

Alternative 2

Matrix

Under this alternative, 586 acres would receive hazardous fuels reduction treatments to reduce existing fuel loads. In addition, 57 acres of slash created by commercial activities would receive fuel reduction treatments in the Matrix. The 29 acres of regeneration harvest (RH & OR) would be more fire resilient in the short-term (7 to 10 years). After the stand is re-established with small trees, however, it would have an increased fire risk until the stand develops into an older age class (generally greater than 80 years of age) or receives thinning treatment to prevent overstocking.

Late Successional Reserve

Post density management fuels reduction treatments in the LSR area would occur on 808 acres. Treatment type may include lop-and-scatter or pile-burning, depending on location and residual fuel loading. Fire risk would increase after the lop-and-scatter treatment due to an increase of activity slash on the ground until the fine fuels decompose within 1 to 3 years after treatment. The short term risk is relatively inconsequential, because the acreage that may be treated by lop-and scatter treatment constitutes 1.4% of the Upper Cow Watershed.

Alternative 3

Matrix

Under this alternative, 586 acres would receive hazardous fuels reduction treatment. Post commercial-harvest fuels reduction treatments are not needed because there are no commercial harvest units proposed with this alternative in the Matrix. There would be no increase in fire risk associated with RH/OR units as these are deferred in alternative 3.

Late successional Reserve

Post density management fuels reduction treatments in the LSR area would occur on 717 acres. Treatment type may include lop-and-scatter or pile-burning, depending on location and residual fuel loading. Fire risk would increase after the lop-and-scatter treatment due to an increase of activity slash on the ground. This risk is relatively inconsequential, however, because the acreage proposed for lop-and scatter treatment constitutes less than 1.3% of the Upper Cow Watershed. Also, fire risk decreases within 1 to 3 years after the lop-and-scatter treatment as fine fuels decompose.

Cumulative effects

From 1974 through 2002, approximately 8,842 acres (19 percent) of the entire Upper Cow Creek watershed (47,416 acres) experienced detectable reduction in vegetative cover based on Medford District geographical information system (GIS) layer, Vegetation Change Detection. This reduction in vegetative cover could be attributed to wildfire, federal management practices (i.e., logging, road construction), private logging, urban growth, or natural disturbances such as wind throw. The cumulative effect is considered minimal when added to 19% vegetation cover reduction during the period from 1974 to 2002. Current information on cleared acres since 2002 has not yet been incorporated into the Medford Change Detection GIS system. Based on recent observations and preliminary data from the Medford Change Detection Project, there have been several large sections that have been logged on non-federal land since this time. An estimated 165 acres of open space were created between 2002 and fall of 2004 within the Galesville HUC 6, and observations estimate an additional 300-400 acres have been harvested since that time for this portion of the watershed. These operations are estimated to have increased the amount of

open space within the fifth-field watershed from approximately 19% in 2002 to 20% based on preliminary data.

In summary, Slim Jim treatments to reduce hazardous fuels and activity slash would occur on a total of 1,451 acres (3% of the fifth-field watershed) under Alternative 2 and on 1,303 acres (2.7% of the fifth-field watershed) under Alternative 3 through slashing, hand piling, hand pile burning, underburning, or lop-and-scatter treatments for the long term (3-5 years after treatment). Other activities occurring in this project include the Galesville Valley Project, containing 309 acres of density management and hazardous fuels reduction within the Upper Cow Creek Watershed. This treatment of fuels is expected to be completed within 1 to 2 years. In 2005, Wildcat Thin was harvested on approximately 110 acres within this fifth-field watershed. The U.S. Forest Service (USFS), Umpqua National Forest, Tiller Ranger District is developing the Cow Creek Shaded Fuel Break Project, a watershed-wide fuels reduction project for their managed portion of Upper Cow Creek watershed. The USFS is planning to implement this project on 1,877 acres within 3 to 5 years. The Roseburg District BLM plans to commercial thin 35 acres within the Upper Cow Creek Watershed, as a part of the Shively Creek LSR Density Management timber sale in June 2005. Since this is a very small portion of the fifth-field watershed (less than 8 percent), the cumulative effect of increasing the fire risk in this watershed is minimal.

3.3 Special Status Wildlife Species (Threatened, Endangered, Sensitive) and Critical Habitat

3.3.1 Northern Spotted Owl (Threatened)

3.3.1.1 Affected Environment

The project area is predominately LSR (Late Successional Reserve) where the objectives are to enhance late successional habitat development. Over 87 % of the BLM-administered land in the Upper Cow Creek watershed is classified as Late Successional Reserve (UCC WA p.54). Predominately only small areas remain of late seral vegetation in the project area with a few stands greater than 100 acres. Many of the riparian reserves are part of existing young plantations (48% less than 80 years of age). Timber harvesting on private land in the area is affecting the overall appearance of the planning area, with its checkerboard ownership pattern. Approximately 3,659 acres of the 9,941 acres (37%) of BLM administered lands, within the Upper Cow Creek watershed is considered to be late-successional forest (UCC WA p. 70).

Seven spotted owl sites are known within the Planning Area in LSR. No owl sites are on the Matrix portion of the Planning area, and none are expected to occur, as existing owl sites on LSR land are close enough to preclude the occurrence of additional owl sites.

Riparian Reserves comprise approximately 34 % of BLM land within the Upper Cow Creek watershed. Currently, about 52 % of the Riparian Reserves on BLM lands are greater than 80 years of age (UCC WA p. 54). Riparian vegetation has been altered as a result of past harvest activities. When these areas were harvested decades ago, there were no established federal

guidelines to protect riparian areas. Consequently, in the absence of riparian buffers, timber from the riparian areas along streams was removed. Over the past several decades, conifer seedlings and other plant species have revegetated these areas.

Extensive harvesting on BLM occurred in the Planning Area prior to the 1990 listing of the spotted owl as a threatened species, and the implementation of the NFP in 1994. Harvesting on private lands continues to be extensive. Other events, such as quarry development, road building, rock slides, herbicide application and fire have contributed to removal or degradation of suitable spotted owl habitat.

Movement and support of owls in the LSR is currently inhibited by many young dense stands not yet suitable habitat for owls. Many of the young stands average 6-10" in diameter, and do not contribute meaningfully to habitat for owls.

Protocol surveys for spotted owls within the project prior to 1994 located 3 spotted owl sites, and 4 spotted owl sites have been located since 1994. No barred owls have been detected.

The function of Matrix lands is to serve as connectivity between late-successional reserves (USDA/USDI. 1994b, p. B-43). Owl sites found after January 1994 receive no mandatory protection, except for the nest site and seasonal restriction (USDA/USDI 2003 BA, p. 72). The reduction of suitable habitat and degradation to owl sites within Matrix is within the assessment of the NFP and the FY 04-08 Biological Assessment, and a shift to increasing numbers of owl sites in maturing large reserves is expected to contribute to the recovery goals and conservations needs of the spotted owls by providing multiple clusters of breeding spotted owls (USDA/USFWS 2003 BO, p.103). Recent research has identified additional uncertainties that may influence the survivability of the spotted owl such as competition from the barred owl, West Nile Virus, Sudden Oak Death, and global warming. However, these studies do not provide management recommendations, therefore the Northwest Forest Plan is our best available management direction until further direction is provided by the Department of Interior. In addition, demographic data from northern spotted owls in the Klamath Demographic Study Area collected from 1985 – 2003 indicate that populations appear to be stable in the Klamath study area as a result of high survival and number of young produced by territorial females, which were stable over the period of the study (USDA/USDI 2004b).

Most of the project area occurs in spotted owl critical habitat unit OR-32.

3.3.1.2 Environmental Effects

Alternative 1 (No Action)

The No Action Alternative would have little impact on late-successional forest and associated species in the Planning Area at this time. If Matrix harvesting is deferred in the future, stands would continue to develop as older forest, with the effect of contributing additional large standing and downed wood. However, stands would likely be reviewed for future actions of harvesting. Temporary and permanent right of way construction would continue on BLM and

private lands to allow private harvesting, removing suitable and dispersal habitat. The survival of spotted owl sites within the Klamath Demographic Study Area would remain stable, and contribute to a stable population within the Klamath Province (USDA/USDI 2004b).

Replanted riparian reserves from past harvesting, now competing for nutrients, would not receive any density management. Approximately 48% of BLM riparian reserves within the Upper Cow watershed are less than 80 years old. Treatment of the riparian reserves for late-successional habitat, benefiting riparian and spotted owls and their prey species, would not occur. Habitat development in the riparian reserves would be reduced as young tree competition increases for nutrients and space.

Management of young LSR forests to enhance habitat conditions around centers of owl activity and promote development of early seral stands created by timber harvest (South Umpqua River/Galesville LSR Assessment 2004 p. S-3) would not occur under the no action alternative.

The lack of treatments to reduce the fuel hazard from excessive dead and down woody material and to reduce the amount of “ladder” fuels would increase the risk of stand replacement fire within the Matrix units and would threaten adjacent LSR habitat. Catastrophic loss of vegetation would threaten spotted owls and late-successional affiliated prey species which depend on these forest habitats for survival, reproduction, and dispersal. Fuels treatments in Matrix may occur under future proposed actions.

Alternative 2 (Proposed Action)

Matrix

Units 6-3, 30-1a, (RH,OR) would remove approximately 29 acres of suitable nesting, roosting, and foraging habitat. Unit 6-3, (16 acres) contains nesting structure for owls, but would not likely be used for nesting because of the small stand size, fragmentation and edge effects from recent adjacent harvests further reducing the amount of interior habitat. Replanting would develop into dispersal habitat in approximately 30 years.

Unit 30-1b (CT) would downgrade 28 acres from suitable for nesting, roosting and foraging, to dispersal habitat. Commercial thinning would reduce future recruitment of snags and resulting down wood created from snags by removing suppressed or defective trees, and would decrease the future quality of the habitat to provide optimal nesting structure, and optimal prey abundance.

The affect of the proposed harvesting in suitable habitat would not likely measurable change the productivity of adjacent owl sites in the LSR, or reduce productivity or dispersal capability for owls in the Cow-Upper watershed. The USFWS Section 7 Watershed (Cow-Upper) encompasses the West Fork Cow, Middle Cow and Upper Cow 5th field watersheds. Resident spotted owls using the treated stands may expand home range size or alter home range configuration to compensate for habitat loss and degradation (Meiman et. al., 2003).

Non-commercial density management/fuels treatment would degrade 586 acres by reducing lower canopy. Removing brush and small diameter trees, and following treatment with underburning would simplify forest habitat structure by reducing vegetative cover, and reducing woody debris. This may reduce or alter the distribution of terrestrial prey abundance for spotted owls. A shift in occurrence wildlife species may occur, favoring species that prefer more open understories. Unit 30-1c and 29-1 would slightly degrade 405 acres of owl nesting habitat, and 29-3 would slightly degrade 181 acres of dispersal habitat.

Late Successional Reserve

Commercial density management (CDM) and non-commercial density management (NDNM) units in the LSR would degrade (retain 40% canopy cover) approximately 465 acres of young dispersal habitat which would retain the function of the critical elements of forage availability, and canopy cover for roosting and protection from predators and weather elements. Approximately 52 acres of young dispersal habitat would be degraded and may not be suitable, with canopy cover being reduced to 30-40%. Dispersal suitability would be regained in approximately 10 years. Small snag and small down wood created from treatment would increase forest structure diversity in these young plantations.

Unit 1-4 and 11-1 (60% canopy retention) would degrade 47 acres of roosting and foraging habitat, but retain habitat quality to continue to provide roosting and foraging.

Young stands responding to increased light, space, and nutrient availability, would increase development of the stand into better quality owl habitat to support roosting and foraging for resident and dispersing owls, in approximately 10-30 years, depending on the age, treatment, and site productivity of the stand.

Six spur roads would be constructed, totaling approximately 0.88 miles (table 2-4), and would not contribute to driveable road density in the project area, or contribute to interior fragmentation of any blocks of late successional habitat. Some trees larger than 20" diameter at breast height may be removed for spur construction, or placement of yarding towers, and would be retained within forested habitat as large down woody debris. The spur road construction would not change the function of adjacent late successional habitat for wildlife species, and would allow for accelerated development of adjacent young stands by providing access for silvicultural late successional reserve density management harvest prescriptions.

Management would enhance the development of habitat conditions around centers of owl activity, and promote development of early seral stands created by timber harvest (South Umpqua River/ Galesville LSR Assessment 2004 p. S-3), and develop the LSR to increase the number of breeding owl sites in maturing large reserves, contributing to the recovery goals and conservations needs of the spotted owls (USDI/USFWS 2003 BO, p.103).

The cumulative effect of harvesting on the viability of spotted owls is determined by disturbance to nesting owls and modification of habitat at the USFWS Section 7 Watershed (West Fork Cow Creek, Middle Cow Creek, and Upper Cow Creek 5th field watersheds) scale (USDI 2003, BO p.

70) through consultation with the USFWS. The amount of anticipated adverse impacts to spotted owls has been accounted for through consultation and incidental take with the U. S. Fish and Wildlife Service (USDA/USDI 2003). The Fish and Wildlife Service analyzed incidental take of northern spotted owls, by accounting for the removal or degradation of all suitable habitat acres.

Harvesting late-successional stands would reduce the viability of owl sites on Matrix lands as anticipated in the NFP (USDA/USDI. 1994a 3&4-241). The effects of disturbance, loss and degradation of habitat due to fire, harvesting, road construction, manifested in the spotted owl population decline rate, are not greater than was analyzed in the RMP (USDA/USDI 1994, p. 4-78) and NFP (USDA/USDI.1994a, pp. 3&4 -211-234). The USFWS compared the Proposed Action with other actions within the Upper Cow Creek watershed and found the loss of suitable habitat to be reasonably well distributed (USDI/USFWS 2003, BO p. 71) and would not preclude spotted owl movement across this watershed. The Proposed Action would result in a “take” of the northern spotted owl (USDI/USFWS 2003 p. F-2).

The Cow-Upper watershed baseline suitable habitat is 30,924 acres. The cumulative removal of 29 acres and downgrade of 28 acres of suitable habitat combined with other projects consulted on within the watershed, is less than 1% (450 acres of 30,924 acres, USDA/USDI 2003 Table 9 p. 73) with loss of suitable habitat reasonably distributed throughout the Cow-Upper watershed (USDI/USFWS 2003, p. 71). The Proposed Action was designed under the guidelines of the NFP and RMP, and project design criteria would minimize impacts to the spotted owl. The spotted owl sites in the Planning Area affected by the Proposed Action are not expected to change the population trend in the Klamath Province. The survival of spotted owl sites within the Klamath Demographic Study Area would remain stable, and contribute to a stable population within the Klamath Province (USDA/USDI 2004b).

Alternative 3

Matrix

No commercial harvesting would occur on Matrix land allocation. Commercial harvesting would likely be reviewed under future actions and considered for harvest. Matrix NDNM/fuels treatment would remain the same and the effects would be the same as Alternative 2.

Late Successional Reserve

Density management in the LSR would be similar to alternative 2. Approximately 0.88 miles of road spur development would not occur. The associated 75 acres of dispersal habitat (Units 29-2a, 3-1, 18-2, 13-1a) and associated portions of previously harvested and replanted associated riparian reserves would not be managed to accelerate development into late-successional habitat, and contribute to the goals of the South Umpqua River/Galesville Late Successional Reserve Assessment. These units would not promote the capacity of the late successional reserve to contribute to the recovery goals and conservations needs of the spotted owls by providing multiple clusters of breeding spotted owls (USDI/USFWS 2003 BO, p.103).

Cumulative Effects (Alternatives 2&3)

Past, present, and reasonably foreseeable projects that could affect the northern spotted owl within the Upper Cow Creek watershed includes the U.S. Forest Service (USFS), Umpqua National Forest, Tiller Ranger District's 1,877 acre Cow Creek Shaded Fuel Break Project, a watershed-wide fuels reduction project to occur within 3 to 5 years for their managed portion of Upper Cow Creek watershed. This project would treat fuels along major roads and within young stands that were formerly plantations. Roseburg District BLM plans to commercial thin 35 acres within the Upper Cow Creek Watershed and construct approximately 1,100 ft of temporary roads as part of the Shively Creek LSR Density Management timber sale in June 2005. This stand does not contain suitable habitat as it is 36 years of age and the average diameter is 11.6 inches. The Galesville Valley Project contains 309 acres of density management and fuels reduction treatments within the Upper Cow Creek Watershed. Stands contained within this project are less than 60 years of age, the majority of treatments are in stands between 30 and 40 years of age, and no trees larger than 7 inches would be cut.

The foreseeable projects may create disturbance to spotted owl foraging habitat for the short term, 1-2 years. Activities would largely remove portions of the understory, which could change the distribution and local density of prey items during this short term period until the understory brush begins to regenerate. The management is expected to be within LSR and Matrix guidelines and effects are to be within the predictions of the FSEIS (USDA/USDI 1994).

3.3.2 Northern Spotted Owl Critical Habitat

3.3.2.1 Affected Environment

The project area overlaps Critical Habitat Unit OR-32. OR-32 is located on Medford and Roseburg Districts BLM and the Umpqua National Forest. Thirty-seven percent of the unit is within the Cow Creek LSR. This unit coincides with the Rogue-Umpqua Area of Concern, which provides an essential link in connecting the Western Cascades Province with the southern portion of the Coast Ranges and northern end of the Klamath Mountains Province. This unit provides the single link from the Western Cascades Province to the Klamath Mountains Province and associated Area of Concern. (USDI/USFWS 2003, BO p. 76). There are approximately 35,273 suitable habitat acres (2003 baseline acres) within the CHU (USDI/USFWS 2003, BO p. 80). The majority of the critical habitat within the project area overlaps the South Umpqua River /Galesville Late Successional Reserve. However, critical habitat also occurs within Matrix units 29-1, 29-3, 30-1a, 30-1b, and 30-1c. See table 2-1 for a complete listing of units and CHU.

3.3.2.2 Environmental Effects

Alternative 1 (No Action)

No action would result in a loss of accelerated and improved desired late successional stand characteristics such as larger crowns, large diameter branches, multi-story development, and a

mix of conifers/hardwoods/shrubs. Large hardwoods currently being suppressed may be lost and creation of small canopy gaps for forest structure diversity would not occur. The closing canopy would exclude or reduce these characteristics. No destruction or adverse modification of nesting habitat would occur. No fuels treatment on Matrix would occur, and the stands would continue to be at increasing risk for loss to fire.

Alternative 2

Matrix

Unit 30-1a and 30-1b are in Critical Habitat Unit OR-32. Harvesting would remove 29 acres containing nesting structure, and downgrade 28 acres from nesting to foraging/dispersal habitat. Unit 30-1a and 30-1b are part of a contiguous habitat block approximately 200 acres in size, which would be adversely modified, but still function as nesting, roosting, foraging, and dispersal habitat.

NDNM/fuels on approximately 181 acres of young forest on Matrix would accelerate the development of roosting, and foraging habitat in unit 29-3 in the young stand with increased growth rates and development of a more complex overstory structure. A short term reduction or change in distribution of prey abundance may occur until fuel treatments are completed.

Approximately 405 acres of NDNM/fuels treatment on late successional habitat (Units 29-1, 30-1c) would reduce some understory structure by removing small tree stems, brush, and some woody debris, but the units as part of contiguous stands, would continue to provide nesting, roosting, and foraging for spotted owls. Terrestrial prey abundance may be reduced or distribution altered for 1-2 years after fuels treatments, including underburns, are completed.

Late Successional Reserve

Any individual trees greater than 20" that may be removed from adjacent habitat (unit 13-2a, 3-1) for spur road construction or yarding tower placement would be placed into adjacent forested habitat, and would not measurably degrade the function of the stands of habitat to provide nesting, roosting, foraging, or dispersal.

Unit 1-4 and unit 11-1 would reduce canopy cover to 60% and degrade but retain the current function on approximately 47 acres of habitat suitable for roosting and foraging as part of adjacent contiguous stands within the LSR.

Density management on approximately 238 acres would modify dispersal habitat by reducing canopy closure to 40-60%, and reduce canopy closure to 30-40% on approximately 52 additional acres. The reduction of canopy to below 40% may not provide adequate protection from predators or weather elements, and could reduce effectiveness of these acres to function as dispersal habitat, and spotted owls may avoid the use of the habitat for 5-10 years as the canopy closure increases. Small snag and small down wood created from treatment would increase forest structure diversity in these young plantations. Density management of units containing

dispersal habitat would not preclude spotted owls from dispersing through the project area through the use of contiguous habitat that are dispersal capable.

Alternative 3

Matrix

No critical habitat would be removed or downgraded in Matrix.

Late Successional Reserve

Management of critical habitat in the LSR would be very similar to Alternative 2. Spur road construction of 0.88 miles would not occur (Units 29-2a, 3-1, 18-2, 13-1a), and falling of individual trees for spur road construction or yarding tower placement would occur.

The management of 75 acres associated with the spur road construction would not occur under this proposal, but may be reviewed under future management proposals. The 75 acres of dispersal habitat and associated portions of previously harvested and replanted associated riparian reserves would not be managed to accelerate development into late-successional habitat. The habitat would continue to function as dispersal habitat, and develop into roosting and foraging habitat to support resident owls, but at a slower rate, and with a less diversified habitat structure. The benefit of creating small young snags, and small down wood would not occur.

Cumulative Effects (Alternatives 2&3)

Other projects occurring within the Upper Cow Creek watershed portion of Critical Habitat Unit OR-32 are density management and hazardous fuels reduction on 309 acres in the Galesville Valley Project expected to be completed within 1 to 2 years. The U.S. Forest Service (USFS), Umpqua National Forest, Tiller Ranger District is developing the Cow Creek Shaded Fuel Break Project, a watershed-wide fuels reduction project within 3 to 5 years for their managed portion of Upper Cow Creek watershed. This Forest Service project contains 142 treatment acres in CHU. Roseburg District BLM plans to commercial thin 35 acres and construct approximately 1,100 ft of temporary roads within the Upper Cow Creek Watershed and CHU OR-62 as part of the Shively Creek LSR Density Management timber sale in June 2005. Treatments proposed within the three fore mentioned projects are located within young stands and would primarily remove a portion of the understory vegetation. This is a very small portion of the fifth-field watershed (8 percent) planned over the next 5 years. The management is expected to be within LSR and Matrix guidelines, and effects within the predictions of the FSEIS (USDA/USDI 1994). The US Fish and Wildlife Service notes in its 2003 Biological Opinion that adverse effects would occur to this CHU in the form of nesting, roosting, and foraging loss or downgrading, the Service determined that the proposed activities would not preclude the ability of the CHU to function as intended (USDI/USFWS 2003).

3.3.3 Fisher (Bureau sensitive, Federal Candidate)

3.3.3.1 Affected Environment

The USFWS (U.S. Fish and Wildlife Service) listed the West Coast distinct population segment of the fisher under ESA in 2004, as warranted but precluded due to other USFWS priorities. (Federal Register April 8, 2004). The document further discloses that extant fisher populations in Oregon are restricted to two disjunct and genetically isolated populations in the southwestern portion of the State: one in the northern Siskiyou Mountains of southwestern region and one in the southern Cascade Range. The fishers in the Siskiyou Mountains near the California border are probably an extension of the northern California population. Fishers in the northern Siskiyou Mountains in Oregon are believed to represent the northern extent of indigenous fisher populations in the Pacific states. Causes of historical population declines in the Pacific states include overtrapping, predator control, and loss of habitat from logging and urban and agricultural development. Dispersal of fishers is thought to be restricted by large rivers and wide highways. There are no confirmed recent sightings in the Glendale RA. Fishers have been documented in the adjacent resource areas of the Medford BLM District, so it is possible that the fisher also occurs in the Glendale RA. The nearest known sighting is approximately 30 miles southwest.

Remote camera surveys (2000-2005) initiated to protocol (Zielinski 1995) in each of the 5th field watersheds in the Glendale Resource Area did not detect the fisher. Seven remote camera stations were placed in the project area (T31S R4W Section 21, 27, 34, 35; T32S R 4W Section 11; T32S R3W Section 7, 17) in 2003.

Approximately 3,659 acres of the 9,941 acres of BLM administered lands, within the 47,416 acre Upper Cow Creek watershed are considered to be late-successional forest. Additional naturally regenerated second growth with high canopy cover and remnant large snags and logs exists that is also suitable for fisher, although most of the 40-80 year old stands are either replanted or have had some selective harvesting. However, most of the sections including and adjacent to the proposed units are highly fragmented from past BLM and private harvesting and road development, and few large blocks (greater than 100 acres) of late-successional habitat remain. The fisher was analyzed in the Northwest Forest Plan and failed to pass the species viability screens due to its dependence on interior forest habitat and large, down woody debris. In addition, the proposed units are in areas poorly suited for fisher.

3.3.3.2 Environmental Effects

Alternative 1 (No Action)

The No Action Alternative would have marginal benefit for the fisher in the Planning Area at this time, however this would not change the trend predicted in the NFP. Matrix harvesting would not occur, but would likely be reviewed in the future for harvest. Temporary and

permanent right of way construction would continue on BLM and private lands to allow private harvesting, removing suitable habitat and increasing road density.

Replanted riparian reserves from past harvesting, now competing for nutrients, would not receive any density management. Approximately 48% of BLM riparian reserves within the Upper Cow watershed are less than 80 years old. Development of portions of the riparian reserves would not occur. Habitat development in the riparian reserves would be decreased as young tree competition increases for nutrients and space.

Management of young LSR forests to enhance habitat conditions and promote development of early seral stands created by timber harvest would not occur.

The lack of treatments to reduce the fuel hazard from both excessive dead and down woody material and to reduce the amount of “ladder” fuels would increase the risk of stand replacement fire within the Matrix units, and would increase the risk to adjacent LSR habitat. Fuels treatments in Matrix may occur under future proposed actions.

Alternative 2

This project would not change the assessment predicted in the NFP, and the impacts from the Proposed Action are expected to be minor.

Matrix

Regeneration/overstory removal prescriptions on Matrix land allocation would remove up to 16 acres of fragmented late-successional upland habitat (Unit 6-3) and 13 acres (Unit 30-1a) of a large (greater than 100 acres) late-successional block. Up to 28 acres (unit 30-1b) of suitable late-successional habitat would be degraded from Matrix commercial thinning. Unit 6-3 occurs close to a heavily used agricultural and homestead area, and a frequently used road system, and therefore is probably not very suitable for the disturbance sensitive fisher. Increasing large retention trees from 6-8 to 9-18 trees per acre ensures meeting down woody debris requirements, and recent surveys conducted to locate fisher populations (with no detections), minimizes the impact to this species (USDA/USDI 1994a, p. 470).

Late Successional Reserve

The creation of 0.88 miles of temporary road spurs would occur in trees averaging 8” (ranging 6”-14”) in diameter and would not remove any late-successional habitat. The road spur construction would occur in previously harvested habitat, and would not cause additional fragmentation of late successional habitat.

Approximately 808 acres of young LSR stands approximately 20-45 years old, including portions of riparian reserves would be thinned (CDM/NDNM) in the LSR to accelerate growth, and the development of late-successional characteristics such as larger crowns, large diameter branches, multi-story development, a diversity in tree spacing, retention of some suppressed or

defective trees, a mix of conifers/hardwoods/shrubs, and small canopy gaps. Accelerating the development would aid in the recovery of fishers by creating dense canopy forest with structural ground diversity used by the species.

Approximately 586 acres of NDMN/fuels treatment on Matrix land would occur. Benefits to Unit 29-3 (181 acres) would be similar to the CDM/NDNM in the LSR to decrease competition increase growth and vigor of retained trees, and benefit the development of larger trees. However, in Matrix land allocation the goal would be to develop wood volume for harvest at approximately 120 years of age. NDMN/fuels treatment in late successional habitat (unit 29-1, 30-1c) may reduce habitat suitability. Future underburns, after initial fuels treatments, would maintain reduced fuel levels and prevent future build-up of fuels. Typically, maintenance underburns could occur 2-7 years following the initial treatments but would be driven by the condition of the stand and re-growth of slashed vegetation. As a result, the stands would have less complex understories and be less suitable for fisher (USDA/USDI 1994 Appendix J2-53) but be at higher risk for loss to fire.

The management of the young stands within the LSR would benefit the restoration of fisher habitat and aid in the recovery of the species, although continued private harvesting and Right-of-Way use and development within the checkerboard ownership would continue to limit recovery.

The largest late-successional blocks are expected to continue be restricted to LSRs. Impacts to potential fisher habitat through loss of late-successional habitat and modification to mid/late seral habitat are minor, due to project design and mitigations (USDA/USDI 1994a, p. 470). Some large snags and down wood den habitat may be lost, or the suitability of potential den sites may be reduced due to harvesting or treatments of fuels.

Alternative 3

Matrix

No commercial removal or degradation of late-successional habitat would occur.

Late Successional Reserve

The creation of temporary road spurs would not occur.

Approximately 75 acres of commercial density management (Units 29-2a, 3-1, 18-2, 13-1a) would be deferred, reducing accelerated management of young forest within the LSR and associated riparian areas to approximately 733 acres. NDNM/fuels treatment would be the same as alternative 2.

Cumulative effects (alternative 2 &3)

With the cumulative effects of private harvesting, low BLM ownership, and few large patches of BLM late-successional habitat at low elevations, the fisher's natural rareness, and slow re-colonization rates of restored habitats; the species is not expected to be well distributed throughout its range (USDA/USDI 1994a, p. 53, 470). The suitability for fisher in the project area is poor due to extensive past BLM and private harvesting, road construction, and large fragmentation at the landscape level due to checkerboard distribution of private and BLM ownership. The suitability for fisher, with recent BLM forest management (Wildcat Thin timber sale recently thinned and retained about 60% canopy cover on approximately 110 acres of forest 40-80 years old in the Wildcat, Whitehorse, and Negro Creek drainages) and the cumulative effects of other future projects within the Upper Cow Creek Watershed, is to remain poor for viable fisher populations due to disturbance and canopy reduction. Such actions reduce habitat suitability, however treatments also reduce the long term risk of habitat loss through fuels reduction. Foreseeable projects within the Upper Cow Creek Watershed includes: density management and hazardous fuels reduction on 309 acres within the Galesville Valley Project expected to be completed within 1 to 2 years, the U.S. Forest Service (USFS) Tiller Ranger District's 1,877 acre Cow Creek watershed Shaded Fuel Break Project within 3 to 5 years, and the Roseburg District BLM's Shively LSR Density Management project of 35 commercial thin acres and construction of approximately 1,100 ft of temporary roads in June 2005, totaling approximately 8% of the fifth-field watershed planned over the next 5 years. The suitability of habitat in the watershed for fisher is expected to remain low, until the LSR habitat matures over the next approximately 50 years. Checkerboard ownership with private and associated private harvesting may preclude the watershed from becoming well suited for fisher.

3.4 Soils & Water Quality

3.4.1 Soils

3.4.1.1 Affected Environment

This watershed is located within the Klamath Mountain Province. The Klamath Mountains were formed from Mesozoic-Jurassic geologic formations which are folded and faulted, and intruded by the collision of the North American and Farallon Plates. Extensive erosion has created steep canyons with slopes averaging 50-60 percent. The project area is mostly the Galice Formation, which is composed of metavolcanic and metasedimentary rock types, intruded by the White Rock Pluton. Soils derived from metasedimentary rock tend to be deeper and have more nutrients, whereas the metavolcanic and granitic soils tend to be shallower, with fewer nutrients and a lower water holding capacity. On many of these soils, especially the granitics; schists, serpentine, peridotite, and some sandstones, it is particularly important that some organic matter is left on site to maintain productivity. Soils in this watershed are generally well drained with moderate permeability, and are between 20-60 inches deep.

Productivity: Soil productivity is affected by soil bulk compaction, soil displacement, and by changes and reductions in soil nutrients. Soil compaction reduces soil productivity and

vegetation growth rate by decreasing soil porosity and increasing density which in turn inhibits productivity by reducing water and nutrient holding capacity, root respiration, and microbial activity. Minimizing the amount of compaction would generally improve stand development and watershed hydrology. The Medford District RMP/EIS provides a series of BMPs designed to prevent unacceptable levels of degradation to the soil resource and related productivity (Vol. 2, pp. 30). Tractor logging has the most potential to compact soils, especially when conducted during the wet season. BMPs also limit the amount of compaction to 12% of the harvested area, and recommend using old skid trails where present or minimizing the width of new tractor skid trails when old trails cannot be used.

An estimated maximum of 5.3 % of the Upper Cow Creek-Galesville HUC 6 watershed was compacted and displaced to varying degrees between 1974 and 2002 due to a road density of 4.7 mi/mi² and disturbance that has resulted from past harvest (Medford Change Detection). This figure was calculated by taking the total acres cleared for each yarding type multiplied by a research derived percentage for the disturbance created as a result of the various yarding techniques. This was then divided by the total HUC 6 watershed acres. Megahan (1980) found that in clearcuts tractor logging disturbed 21% of the ground and skyline cable yarding disturbed 7%. The total compaction was calculated assuming that 75% of the units were tractor logged clearcuts, and the rest were skyline yarded clearcuts. This is an over-estimate since many units on federal land are commercially thinned which reduces disturbance estimates by almost 40% and many of these acres were cut 20-30 years ago, so it is likely that there has been some reduction in compaction due to revegetation on some of these sites. Road acres were assumed to be 100% compaction, and road acreage is based on a 20 foot road width.

Fuels treatments, in addition to reducing the risk of uncontrolled fires, generally reduce the amount of vegetation competing for soil nutrients and water, thus increasing site productivity. Non-commercial and commercial thinning treatments also benefit soil productivity by effectively increasing water and nutrient availability. However, heat resulting from large scale fires can damage soil biology such as mycorrhizae, nitrifying bacteria, and other soil organisms in proportion to burn intensity, adversely affecting soil productivity for up to 10 years (Barnett, 1989). Removal of nutrient rich organic layers by fire, can also affect productivity locally. BMPs focus heavily on maintaining cooler burning conditions that occur during spring-like conditions to reduce losses in productivity that result from over heating the soils. The extent of this loss, though expected to be a relatively small percentage of the 2,457 acres that have burned in this watershed since 1967 (Sec. 3.2 Fire Risk), has not been measured.

Erosion: In addition to reducing productivity, displaced soil often becomes mobilized, potentially accelerating sediment delivery to streams. Many forest management activities can result in accelerated erosion. So in addition to the BMPs implemented to reduce soil displacement, the Medford District RMP/EIS recommends several BMPs to guide federal forest projects designed to reduce this amount of sediment that moves off-site to acceptable levels under the Clean Water Act and ACS objectives of the NWFP. Some of these include maintaining and improving riparian zones, applying seasonal restrictions to unsurfaced roads and tractor yarding activities, and taking special precautions when managing stands on unstable or fragile soils. It is generally recommended that projects are designed using partial suspension on all

yarding activities, using seasonal restrictions for yarding and unsurfaced road use, and where exposed soil may result in accelerated erosion, waterbars, seeding, and mulching should be applied. Additionally projects should minimize the amount of open area created, while still meeting project objectives, so that fewer acres are vulnerable to erosional events such as rain splash and rain or snow events. Off-site transport of sediment to waterways will be discussed further under section 3.5, water quality.

Soils in this watershed are generally stable on most hillslopes under 65%, both within forested stands and riparian areas, and are not actively experiencing a great deal of erosion. Recent past logging operations, on non-federal lands, have left several large areas of exposed soil that is prone to extensive erosion. These sites must be planted within 3 years (“healthy and out-competing other vegetation within 6 years” OFPR) under the Oregon Forest Practices Act, but would continue to erode until new vegetation covers exposed soils. This type of large scale clear-cutting is a common business practice and it would be expected that erosion from sites such as these would continue in the future. Currently about 22% of the forests in this HUC 6 watershed have been cleared as a result of logging or fire in the last 30 years (Medford Change Detection and recent observations). It would be expected that for each occurrence, either of these types of impacts resulted in a short term increase in erosion that was likely reduced greatly within the first year or two, upon re-growth of vegetation. Roads modify hydrology both through interception of precipitation on the road surface, and through interception of subsurface flow (Wemple and Jones, 2003 [Megahan and Clayton, 1983]). This can cause increased channelization of hillslopes and mass wasting (Wemple and Jones, 2003). Un-maintained and poorly maintained roads, and native surface roads used for winter haul, are the largest ongoing sediment sources in this watershed. Un-vegetated ditchlines, road surfaces, and cross drains all mobilize soils. Fire can increase the risk of dry ravel and rill erosion on severely burnt, steep sites by reducing the adhesive properties of water found within the organic matter, microbes, fungal filaments, woody debris, and roots in the soil matrix (Barnett, 1989). Some signs of accelerated erosion can be seen within this watershed on sites that have previously burned, however, most recent fires within this watershed have been relatively small, reducing the amount of areas prone to severe burning. Where present in this watershed, most of these sites appear to have partially recovered with the re-growth of vegetation and water retaining organic ground cover, such as logs, branches, and other forest debris.

Mass Wasting: Slide areas on BLM are found in Snow Creek and Meadow Creek drainages, as well as near the fault contacts, where intrusions of serpentized rock bands are between other geologic formations within this project area. In general, relatively small slides are the only form of mass wasting that occurs within this watershed. Roads increase the risk of slides, especially if they are not outsloped, or are near a ridge. Timely culvert and cross drain maintenance is important to keep channelized water from backing up behind the road fill and causing the road to fail. It appears that large scale fires that have burned within this watershed have also caused a few small, isolated slides to occur. This is particularly seen near fault lines, and on steep slopes, where the soil cohesion was reduced when roots and other stabilizing materials within the soil were burnt.

3.4.1.2 Environmental Effects

Alternative 1 (No Action)

Productivity: There would be no change in the productivity of the land as a result of this alternative. Existing compacted acres would continue to slowly improve naturally over time. No additional compaction would be created by yarding corridors or temporary road building. There would be no reduction in the existing compaction as a result of the decommissioning of 0.80 miles of roads or from the subsoiling of existing tractor trails within unit 17-1a. Timber yarding and road building would continue to reduce productivity on non-federal lands within this watershed. Hazardous fuels, commercial and non-commercial thinning treatments, which generally reduce the amount of vegetation competing for soil nutrients and water, and therefore increase site productivity, would not occur. This alternative would eliminate isolated, pile and burn, and under-burning activities. These activities are low intensity and generally leave a large portion of the larger organics on site. Because no hazard fuel reduction would take place, the likelihood of a higher intensity, large scale uncontrolled burn, that would likely reduce productivity on some sites in the long and short term, would remain the same. Long term damage would typically result from the removal by fire of nutrient, fungi, and, bacteria rich woody materials on severely burnt sites (Barnett, 1989).

Erosion: Erosion levels would be unaltered as a result of this alternative. Chronic sediment sources such as the 2.54 miles of roads that are proposed for blocking, gating, and decommissioning would be left open. This alternative would eliminate the short term increase in erosion that occurs during road decommissioning and blocking, because no ripping would take place. However with unrestricted traffic many of these roads would continue to deteriorate and chronically erode over time. Timber haul routes would not be renovated, and would be left unmaintained until such time that additional funding became available. The need to decommission 0.88 miles of new temporary road would not be necessary, also reducing erosion in the short term. There would be no erosion as a result of timber yarding operations. No additional timber slash would occur under this alternative. This would reduce the amount of ground fuels in the short term and lessen the chance of a relatively hot burning fire occurring on these sites. Long term fire danger would continue to increase since no hazardous fuels treatments are proposed under this alternative. This would slightly increase the chance of dry ravel and rill erosion sites developing as a result of the severe fire activity that is associated with heavy fuel loads and dry weather burning condition.

Mass Wasting: No roads would be added or removed under this alternative. Road maintenance and improvements, such as outsloping which would remove ditchlines and cross drains, that can become clogged and cause roads to slide, would not occur. Roads would continue to deteriorate, increasing the likelihood of slides over time. The likelihood of a large scale fire would continue to increase because no fuels reduction would take place. This would increase the chance of a severe fire destroying large trees, and the root systems of these trees, which typically help to stabilize soils within this watershed. As such, this alternative would not reduce the risk of mass wasting.

Alternative 2 (Proposed Action)

Productivity: This action would result in soil compaction that would reduce localized areas of soil productivity. The amount of affected land would include approximately 7 acres of tractor yarding corridors, 16 acres of cable yarding corridors, 0.5 acres of helicopter yarding, 2.2 new temporary road acres (to be decommissioned after use), and the renovation of 2 acres of helicopter landings. These acres were calculated using research values from Megahan (1980) for commercial thinning treatments. Harvesting would result in compaction on about 7% of cable harvest units, 1% of helicopter-logged units, and 13% of tractor logging units. Together, the incremental effects of compaction caused by these activities would reduce productivity in this watershed by approximately 0.16% above existing levels. Subsoiling tractor trails, where practical, and temporary logging roads (See PDFs, sec 2.3.7) would reduce compaction on these sites by as much as 80% (Froehlich and Miles; Davis), substantially restoring the infiltration of water and nutrients into the soil. Productivity would also be increased as a result of the 2 existing road acres that would be decommissioned, and by subsoiling the existing tractor skid trails within thinning unit 17-1a. Fuels reduction treatments and density treatments on 1,451 acres of would reduce the amount of vegetation competing for soil nutrients and water, thus increasing site productivity. The isolated pile/burn/underburning activities are low intensity, reducing the depth the soil is affected to as little as 1cm, and generally leave a significant portion of the larger organics on site. This helps to maintain the productivity of the site in the long term, with a limited short term effect. Hazardous fuels reduction would reduce the likelihood of a high intensity, large scale uncontrolled burn occurring, which could have long term effects to the productivity of severely burned acres.

Erosion: Removal of timber would result in erosion produced by traffic on 34.3 miles of unpaved log haul roads, approximately 7 acres of tractor yarding corridors, 16 acres of cable yarding corridors, 0.88 miles of temporary road building (and decommissioning after use) , and the renovation of 2 acres of helicopter landings. Erosion from these activities would be mitigated by seasonal restrictions, a requirement of one-end suspension for yarding, and the use of erosion control methods such as seed and mulch (Further information on this is available in section 2.3). Tractor logging would be mostly ridge-top or done using existing skid trails, and would only occur on slopes less than 35%. As a result, erosion from these actions would be minimal and short term. The decommissioning of approximately 0.80 miles existing road and 0.88 miles of temporary new road, as well as the maintenance and renovation of 34.3 miles of roads which are currently in varying levels of deterioration, would be expected to cause some erosion to occur during the implementation of these projects, but would result in a long term reduction in chronic erosion currently being produced by these roads. The proposed blocking of 1.74 miles of native surface road, would cause little, if any erosion to occur, and though it would not completely eliminate the erosion from off the site, it would greatly reduce the amount of erosion currently being created by wet weather use and poor road surface conditions on this road, while still allowing emergency access to this area during the summer by fire crews. Under this alternative it would be expected that an overall short term increase in the intensity of erosion would occur, but that the resulting mobilized sediment, due to PDFs and the disperse location of these activities, would not adversely affect water quality above existing levels, and as a result of restoration activities, sediment would be reduced in the long term. Fire hazard would increase in the short

term as a result of the 1,451 acres of timber slash that would be created under this alternative. This increase in ground fuel load would be mitigated through pile/burn/under-burning fuel reduction and some lop and scatter. These activities would be of low intensity, and would leave a portion of the ground cover organics in place. Studies have shown that there are no significant losses to of organic matter with light, and moderately-light burns, and/or wet soil conditions (Burnett 1989 [Neal et al. 1965]). These types of fires would be consistent with federal fuels reduction treatments. Therefore by treating these areas, the chance of dry ravel and rill erosion sites developing as a result of the severe fire activity that is associated with heavy fuel loads, and dry weather burning conditions, would be reduced.

Mass Wasting: This alternative could potentially increase the risk of a small, isolated slide or slump occurring within a unit, mainly within the Snow Creek and Meadow Creek drainages, and near the fault contacts in units 1-1a, 7-2, 30-1b, and 30-1c. However, these areas have been examined on the ground, and there are no indications that a slide would result from harvest activity. Road and culvert maintenance on 34.3 miles of road, would help to reduce the risk of a road initiated slide by ensuring that cross drains, ditchlines, and culverts are all properly routing water downslope away from the road. By reducing the risk of a high intensity large scale fire, this alternative would reduce the change of mass wasting within and adjacent to the treated acres.

Alternative 3

Productivity:

Soil compaction would still cause localized reductions to productivity under this alternative. The amount of compaction would be reduced by 2.2 acres, as a result of eliminating all new temporary road construction. Several units that would no longer have access would be deferred as well. This would reduce compaction from cable yarding corridors from an estimated 16 acres of compaction to about 12 acres, and would eliminate helicopter logging. This change would increase the compaction by 0.13% over existing levels. Fuels reduction treatments and density management treatments on 1,303 acres would still occur, however commercial thinning acres would be eliminated and commercial density management and would be decreased to 356 acres. This would still reduce the amount of vegetation competing for soil nutrients and water, thus increasing site productivity on the acres treated. No benefit would occur on the 119 deferred density management acres which would likely continue to grow at a restricted rate due to crowding and competition. All other effects including tractor logging and hazardous fuels reduction would be the same as those described under alternative 2.

Erosion: The amount of area prone to erosion would be reduced under this alternative. By eliminating all new temporary road construction, erosion from building, use, and decommissioning of 2.2 road acres would be eliminated. Several units that would have been accessed via these roads, would no longer have access, and would be deferred as well. This would reduce acres of potential erosion of cable yarding corridors from an estimated 16 acres in alternative 2, to about 12 acres. Additionally, all helicopter units would also be deferred, eliminating the need to renovate 2 acres of helicopter landing sites, further reducing short term erosion potential. All other effects from erosion are the same as described in alternative 2.

Mass Wasting:

Mass wasting effects are the same as described in alternative 2.

3.4.2 Water Quality

3.4.2.1 Affected Environment

Sedimentation: Sedimentation can be increased by forest management activities. All sources of erosion discussed in the Soils section have the potential to increase sedimentation to streams. As a result within the Medford District RMP/EIS a list of BMPs designed to both reduce the amount of soil displaced and the amount of sediment that enters the streams as a result of timber harvest, road use, construction, decommissioning, and maintenance, prescribed fire, and others (Vol 2, pp.31). Any sedimentation to streams as a result of federal projects must comply with the NWFP ACS objectives and the Clean Water Act. ACS objectives allow for a short term impact, if that impact is intended to result in a long term improvement to water quality and aquatic organism habitat. The Clean Water Act therefore acts as the standard for increases in sediment to the stream. Currently this standard is based on the turbidity within a stream. A complete description of this standard is available at www.epa.gov/waterscience/criteria/sediment/appendix3.pdf but effectively states that cumulative increases in turbidity cannot exceed natural stream turbidities by more than ten percent, as measured by a control point immediately upstream of a project.

Open acres are prone to erosional events such as rain splash, rilling, and gully formation. About 20% of the forests in this watershed were cleared between 1974 and 2002 as a result of logging or fire. An additional 2% estimated to have been cleared since then, for a total of about 22%. Some of the harvest activity that has occurred in the recent past on private lands in the project area currently has the potential of increasing sediment loading in the streams particularly Sugar and Snow Creeks. Logging activity on non-federal lands is done in accordance with the State of Oregon Forest Practice Rules but is not regulated under the Northwest Forest Plan, which provides additional guidelines protecting water quality to meet the needs of aquatic and riparian ecosystems. These streams flow through granitic soils which are easily eroded and thus transported to the streams. There are sediment deposits in all streams tributary to Snow Creek, Sugar Creek and Meadow Creek as a result of past logging practices and erosion from forest roads (Upper Cow Creek WA). This watershed currently has a road density of 4.27mi/mi². NOAA Fisheries considers watersheds to be not properly functioning when road densities reach 3.0 mi/mi². Currently 23% of these roads are within one tree length of streams, and many are poorly surfaced. Un-maintained and poorly maintained roads, and native surface roads used for winter haul, are the largest ongoing sediment sources in this watershed. Studies have shown that roads can contribute 50-80% of the sediment that enters streams (Hagans et al., 1986). Un-vegetated ditchlines, road surfaces, and cross drains all mobilize soils which can enter streams. Roads also modify hydrology both through interception of precipitation on the road surface, and through interception of subsurface flow (Wemple and Jones, 2003 [Megahan and Clayton, 1983]). Channelization of this flow in ditchlines and cross drains, has led to gully formation and slumping in some hillslopes within this watershed. Roads, due to their connectedness with the

stream network, and clear-cuts which are located adjacent to streams, can contribute large amounts of sediment to streams, reducing habitat suitability for fish, amphibians, and other aquatic vertebrate and invertebrate species.

3.4.2.2 Environmental Effects

Alternative 1 (No Action)

Sedimentation: Sediment inputs to streams would not be altered as a result of this activity. Under this alternative there would no projects that would result in a short-term increase in sedimentation, or any projects that would result in a long-term reduction of sediment that would be beneficial to water quality and aquatic species within the watershed. Chronic sources of sediment resulting from 2.54 miles of roads that are proposed for blocking, gating, and decommissioning would continue to increase sediment loading within Maple Creek and Snow Creek. Roads would continue to deteriorate, and resulting stream sedimentation would likely increase over time.

Alternative 2 (Proposed Alternative)

Sedimentation: Small amounts of sediment would be mobilized to streams during the first winter season as a result of the increased erosion discussed above in Section 3.4.2.2. These activities, including tractor and cable yarding corridor erosion, erosion of log haul roads, erosion from road building and decommissioning projects, short term increases in fire potential which could lead to dry ravel and rilling, and erosion from road maintenance, would not be expected to cause enough sediment to enter any one stream for state TMDL standards to be exceeded, because PDFs would be in place that are designed to limit the amount of erosion, and subsequent sedimentation (see Section 2.3 Project Design Features). Studies have shown that “the predominant factors which influence the relationship between on-site erosion and sediment delivery (to the streams) are landslope and width of effective buffer strip to trap sediment (Amaranthus, 1981)”. By using the Ecological Protection Width Needs Chart, the eroded material that enters the streams is considerably reduced. These effects would be within the ACS guidelines, which are designed to maintain and improve aquatic habitat in the long-term, and would be expected to be immeasurable following the first flood event after treatments. This amount of sedimentation would not be expected to have any adverse effect on fish habitat, macroinvertebrate population compositions, or other aquatic organisms in the long term. Chronic sediment inputs to Maple Creek and Snow Creek resulting from 2.54 miles of deteriorating roads would be reduced as part of this project through blocking, gating, and decommissioning under this alternative.

Alternative 3

Sedimentation: Because five of the cable yarding units would be deferred under this alternative, the potential erosion from cable yarding corridors would be reduced to about 17 acres. The elimination of road building reduces potential erosion from the building, use, and decommissioning of another 2.2 road acres. In addition, by deferring both helicopter logging

units, erosion that would have resulted during the renovation and use of 2 acres of helicopter landing sites is also eliminated. Reducing the potential for erosion would subsequently reduce the amount of mobilized sediment that would be available to enter the streams. However, since PDFs and project design features would be applied to minimize sediment delivery to streams under all alternatives, the reduction in sedimentation, as a result of this alternative compared to alternative two, would likely only be measurable in the streams immediately below eliminated sites during the first season. All other sedimentation effects are the same as described in alternative 2.

3.4.3 Cumulative Effects to Soils and Water Quality

Because water quality and soil productivity standards are at the project level, cumulative effects of these environmental elements have been analyzed at the HUC 6 scale. The effects of Slim Jim, when measured at the HUC 5 scale would be minimal and undetectable, and would not allow a sound decision to be made as to the effects of this project when put in context with other activities within the watershed. Past events in this HUC 6 watershed created approximately 3,050 acres, or 20%, of open area between 1974 and 2002. Current information on cleared acres since 2002 has not yet been incorporated into the Medford Change Detection GIS system. Based on recent observations and preliminary data from the Medford Change Detection Project, there have been several large sections that have been logged on non-federal land since this time. An estimated 165 acres of open space were created between 2002 and fall of 2004, and observations estimate an additional 300-400 acres have been harvested since that time. These operations are estimated to have increased the amount of open space from approximately 20% in 2002 to up to 22% based on preliminary data. A combination of cable and tractor yarding was used in these operations. As a result of these activities, compacted and displaced soils within Cow Creek-Galesville HUC 6 watershed have increased by no more than about 0.7%. This was calculated using a 60/40 split between tractor and cable yarding, since less tractor yarding occurs today, and includes the addition of 10 acres of road outside these units, raising the total existing percentage disturbed to about 6% of the watershed.

In addition to these very recent past operations, Roseburg BLM will be conducting a commercial thinning operation on 35 acres, and adding 1,100 feet of road within this watershed. Alternative 2 of the Slim Jim project would commercial log a total of 504 acres, 29 of these would be regeneration harvest or overstory removal. Under alternative 3, a total of 356 acres would be logged commercially and no regeneration or overstory removal would occur. There are no additional federal or non-federal operations pending in this HUC 6 watershed based on ODF New Notifications and Renewals report for June 29, 2005 (Copies available at the BLM Grants Pass Interagency Office or the ODF office in Merlin). The effects to productivity as a result of all these actions would be a short term loss to all compacted acres, though the extent of this loss would vary based on the project design features used to limit soil compaction. The combined percentage of compacted and displaced soils in this HUC 6 watershed, including all known past, present, and future operations on federal and private lands, would total a maximum of approximately 6.01% under alternative 1, 6.23% under alternative 2, and 6.20% under alternative 3. Some of these effects for alternatives 2 and 3 would be mitigated on Medford BLM land

through subsoiling of temporary roads, and skid trails, where possible, which can remove up to 80% of the compaction created.

Density management and fuels treatments would occur in this HUC 6 on an additional 309 acres as part of the Galesville Valley Project (BLM-Glendale Resource Area). These operations are expected to occur within the next 1-2 years. The Tiller Ranger District of the US Forest Service is also developing a fuels plan in this area that would extend outside this HUC 6, and would total approximately 1,877 acres throughout the HUC 5 Cow Creek watershed. These acres would be mostly outside the Cow Creek- Galesville HUC 6 as Forest Service only manages about 320 acres within this watershed. The Slim Jim project would add 1,451 acres (alternative 2) or 1,303 acres (alternative 3) of density management and fuels treatments. Assuming the USFS treats all 320 acres of land that they manage in this watershed, a maximum total of 2,274 acres would potentially be disturbed within this HUC 6 watershed. This disturbance from density management and fuels treatments can be beneficial to the productivity of the stand, as well as considerably reduce the risk of a catastrophic wildfire that could result in a long term loss of soil organisms from deep heating of the soil, and an increase in erosion resulting from dry ravel and rilling. It is likely that these activities would result in isolated areas of short term erosion and loss of productivity as described under Soils, Section 3.4.1. These impacts would be within the scope of the Medford RMP, and would not be expected to move off-site because large organic ground cover would remain on site, and soils would not be excessively heated, thus maintaining much of their adhesive properties (see Soils 3.4.1).

The amount of increased erosion as a result of the logging and fuels projects within this HUC 6 watershed include the additional road use, and maintenance associated with these activities, and erosion from the additional estimated maximum of 0.23% of disturbed land from yarding corridors, new landing construction, additional road building of approximately one mile by federal agencies and non-federal owners within the watershed, and the decommissioning and subsoiling of roads, landings, and tractor skid trails under the Slim Jim project (discussed above). Combined, these activities are expected to result in a short term increase the amount of erosion occurring in this watershed. Much of this erosion is expected to be stored on site where vegetation, and downed organics still remain, and within the riparian zone vegetation where it is already present. Where this is not the case, all logged sites must be planted within 3 years under OFPR, and many sites are often planted sooner. Once vegetation has re-established on a site, the amount of erosion that moves off site is drastically reduced, decreasing the amount of soil mobilized off-site. Roads and areas where clearcut logging extends into the ecological riparian buffers would likely contribute the major portion of the erosion related sediment to the streams and waterways. Erosion coming from these activities would be expected to pulse during winter months when streams are highest, and would therefore be expected to remain within the Oregon turbidity standards required under the Clean Water Act. There could be a short term increase in the stream substrate embeddedness and percentage of fines immediately downstream of streamside logging operations. All federal projects would retain adequate riparian vegetation to trap sediment, thus it would not be expected that a measurable increase in the embeddedness of stream substrate or the percentage of fines in streams would result from any activities associated with the Slim Jim Project. Road maintenance activities would mitigate some chronic erosion by

improving road surfaces and road drainage prior to use. Road decommissioning under Slim Jim would also reduce some chronic sediment sources as discussed above.

The Slim Jim project has been designed to minimize the effects to water quality in such a way that all state water quality standards and federal NWFP aquatic conservation strategy objectives are met under all alternatives. This project benefits to the riparian reserves, including the acceleration of large woody debris and multistory canopy stands, would improve the long term water quality and aquatic habitat conditions. In the long term, road maintenance, blocking, mulching and seeding, and decommissioning activities would improve aquatic health by reducing chronic sediment problems. Productivity would be reduced slightly in the short term but through mitigation activities such as subsoiling and road decommissioning and re-seeding, these effects would not be measurable in the long term on the HUC 6 scale.

Chapter 4.0 List of Preparers

The following individuals participated on the interdisciplinary team or were consulted in the preparation of this EA:

<u>Name</u>	<u>Title</u>	<u>Primary Responsibility</u>
Marlin Pose	Team Lead	Project Management
	Wildlife Biologist	Wildlife, T/E Animals, S&M Species
Michelle Calvert	Ecosystem Planner	NEPA
Colleen Dulin	Hydrologist	Soils, Watershed, Riparian, Fisheries
Bob Bessey	Fish Biologist	Fisheries analysis consultation
Donni Vogel	Fuels Specialist	Fuels
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Rachel Showalter	Botanist	Botany & Noxious weed coordinator
Katie Wetzel	Outdoor Recreation Planner	Recreation
Amy Sobiech	Archaeologist	Cultural Resources
Deston Russell	Civil Engineering Technician	Roads & Gates
Jim Brimble	Forester	Silviculture
Sarah Bickford	Forester	Logging systems
Craig Brown	Forester	Logging systems
Dave Eichamer	Forester	Special Forest products

Chapter 5.0 Public Involvement and Consultation

5.1 Public Scoping and Notification

5.1.1 Public Scoping Meeting

A public meeting to kickoff scoping was held on October 7, 2004 at the Azalea Grange Hall to introduce the proposed project activities. Public input and concerns were collected regarding the project. Approximately 30 local residents and interested public attended the meeting. The project lead attended an Azalea town hall meeting on February 11, 2005 for Slim Jim for a question and answer session.

5.1.2 30-day Public Comment Period

The Environmental Assessment will be made available for a 30-day public review period. Notification of the comment period will include: the publication of a legal notice in the Daily Courier, newspaper of Grants Pass, Oregon; and a letter to be mailed to those individuals, organizations, and agencies that have requested to be involved in the environmental planning and decision making processes for proposed timber sales. Comments received in the Glendale Resource Area Office, 200 NE Greenfield Road, Grants Pass, Oregon 97526 on or before the end of the 30-day comment period will be considered in making the final decision for this project.

5.2 Consultation

5.2.1 United States Fish and Wildlife Service

In accordance with regulations pursuant to Section 7 of the Endangered Species Act of 1973, as amended, consultation with the USFWS concerning the potential impacts of implementing either of the action alternatives upon the Northern spotted owl has been completed. The Slim Jim Project was included within the programmatic biological assessment prepared by the interagency Level 1 Team for FY 2004-2008 projects and subsequent programmatic biological opinion issued by USFWS (*USFWS reference 1-14-03-F-511*).

5.2.2 State Historical Preservation Office

The State Historical Preservation Office approved the clearance/tracking form for the Slim Jim Project. The form is contained within the Slim Jim Analysis file.

5.2.3 NOAA Fisheries (National Marine Fisheries Service)

Since Galesville Reservoir, located at the base of Upper Cow Creek watershed, is a complete barrier to anadromous fish passage, the Oregon Coast coho salmon and Oregon coast steelhead located above Galesville Dam are not considered to be part of the candidate T&E Evolutionary Significant Unit. These fish above Galesville Dam are artificially planted and landlocked so it is impossible for juvenile fish to naturally migrate downstream to complete their lifecycle, and contribute to the recovery of the species. As a result, there are no T&E species or critical habitat present above the Galesville Dam. The portion of the Slim Jim Project that is above the Galesville Dam is exempt from consulting with NOAA Fisheries. The hazardous fuels reduction treatments located in the adjacent Evans Creek Watershed would have no effect on Southern Oregon/Northern California coho salmon (ESA-listed as Threatened) because PDFs, combined with treatment technique and location, would prevent sediment from entering streams and from altering peak flow in the species' nearest habitat, 1.3 miles downstream in Evans Creek; therefore no further consultation is required.

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Glossary

Acronyms and Glossary

Abbreviations:

ACS	Aquatic Conservation Strategy
BLM	Bureau of Land Management
BMP(s)	Best Management Practices
CDM	Commercial Density Management
CT	Commercial Thinning
DBH	Diameter at breast height
EA	Environmental Assessment
ESA	Endangered Species Act
GIS	Geographic Information System
IDT	Interdisciplinary planning team
NEPA	National Environmental Policy Act
NDNM	Non-commercial density management
NFP	Northwest Forest Plan
ODFW	Oregon Department of Fish and Wildlife
OR	Overstory Removal
RH	Regeneration harvest
USDI	United States Department of Interior
USFWS	United States Fish and Wildlife Service

Activity fuels. Residual slash created from thinning or harvest removal activities.

Affected Environment. The natural, physical, and human-related environment that is sensitive to changes due to proposed actions.

Anadromous Fish. Fish that are born and reared in freshwater, move to the ocean to grow and mature, and return to freshwater to reproduce. Salmon and steelhead are examples.

Best Management Practices (BMP). Practices determined by the resource professional to be the most effective and practicable means of preventing or reducing the amount of water pollution generated by non-point sources; used to meet water quality goals (See Appendix D in RMP (USDI BLM 1995)).

Broadcast Burning. Allowing a prescribed fire to burn over a designated area within well defined boundaries for reduction of fuel hazards or as a silvicultural treatment, or both.

Candidate Species. Those plants and animals included in Federal Register “Notice of Review” that are being considered by the U.S. Fish and Wildlife Service for listing as threatened or endangered.

Canopy. The more or less continuous cover of branches and foliage formed collectively by adjacent trees and other woody species in a forest stand.

Coarse Woody Debris. Portion of trees that have fallen or been cut and left in the woods. Usually refers to pieces at least 16 inches in diameter.

Commercial Thinning. The removal of merchantable trees from most often an even-aged stand to encourage growth of the remaining trees.

Critical Habitat. Under the Endangered Species Act, (1) the specific areas within the geographic area occupied by a federally listed species on which are found physical and biological features essential to the conservation of the species, and that might require special management considerations or protection; and (2) specific areas outside the geographic area occupied by a listed species when it is determined that such areas are essential for the conservation of the species.

Density Management. Objectives of the treatment is to reduce stand stocking to maintain or enhance the following: forest/stand health, stand structure and function for wildlife, and stand characteristics for purposes other than growth and yield. One such application is to reduce lateral fuels should a wild land fire occur. There are two types of density management – commercial and non-commercial.

Commercial – treatments would remove merchantable size logs (7 to 20 inches dbh) from the site and would loosely resemble commercial thins.

Non-commercial – treatments would not remove commercial size trees from the site (although some merchantable size trees may be felled or girdled and left on the ground for wildlife or other objectives). Species cut would depend on treatment objective and species (presence and abundance) on the site. Smaller size trees (< 7 inches dbh) would generally be those that would be removed.

Diameter at Breast Height (dbh). The diameter of a tree 4.5 feet above the ground on the uphill side of the tree.

Effects (or Impacts). Environmental consequences as a result of a proposed action. Effects provide the scientific and analytical basis for comparison of Alternatives. Effects might be either direct (caused by the action and occur at the same time and place) or indirect (occurring later in time or at a different location, but are reasonably foreseeable or cumulative results of the action).

Effects and impacts as used in this EA are synonymous. Effects include ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic quality, historic, cultural, economic, social, or healthy effects, whether direct, indirect, or cumulative. Effects might also include those resulting from actions that might have both beneficial and detrimental effects, even if on the balance it appears that the effects would be beneficial.

Endangered Species. Any species defined through the Endangered Species Act of 1973 as amended, as being in danger of extinction throughout all or a significant portion of its range and published in the Federal Register.

Environmental Assessment (EA). A statement of the environmental effects of a proposed action and alternatives to it. It is required for major federal actions under Section 102 of NEPA and is released to the public and other agencies for comment and review. It is a formal document that must follow the requirements of NEPA, CEQ guidelines, and directives of the agency responsible for the project proposal.

Erosion. Detachment or movement of soil or rock fragments by water, wind, ice, or gravity. Accelerated erosion is more rapid than normal, natural, or geologic erosion, primarily resulting from the activities of people, animals, or natural catastrophes.

Evolutionary Significant Unit. The National Marine Fisheries Service (NMFS, NOAA Fisheries) definition is as follows: a population must satisfy two criteria to be considered an ESU: (1) it must be substantially reproductively isolated from other conspecific population units; and (2) it must represent an important component in the evolutionary legacy of a species. 69 Fed. Reg. at 31355.

Forb. Any herb other than grass.

Fuels. Combustible wildland vegetative materials present in the forest which potentially contribute to a significant fire hazard.

Fuels Management. Manipulation or reduction of fuels to meet forest protection and management objectives while preserving and enhancing environmental quality.

Handpile burning. Prescribed fire used to remove man-made or natural collections of concentrated woody debris. Generally the fire is hotter than in broadcast burning or underburning.

Hazardous fuels reduction. Existing vegetation that is a fuels hazard.

Hardwoods. A conventional term for broadleaf trees and their wood products.

Hydrologic. Pertains to the quantity, quality and timing of water yield from forested lands.

Impacts. A spatial or temporal change in the environment caused by human activity. See effects.

Intermittent Stream. Any nonpermanent flowing drainage feature having a definable channel and evidence of scour or deposition. This includes what are sometimes referred to as ephemeral streams if they meet these two criteria.

Land Use Allocation. Allocations of a land area which defines allowable uses/activities, restricted uses/activities, and prohibited uses/activities. Each allocation is associated with a specific management objective.

Matrix Lands. Forest land managed on a regeneration harvest cycle of 100 years. A biological legacy of six to eight green trees per acre would be retained to assure forest health. Commercial thinning would be applied where practicable and where research indicates there would be gains in timber production.

No-Action Alternative. The No-Action alternative is required by regulations implementing the National Environmental Policy Act (NEPA) (40 CFR 1502.14). The No-Action alternative provides a baseline for estimating the effects of other alternatives. When a proposed activity is being evaluated, the No-Action alternative discusses conditions under which current management direction would continue unchanged.

Overstory Removal. The final stage of cutting where the remaining overstory trees are removed to allow the understory to grow. Overstory removal is generally accomplished three to five years after reforestation and when adequate stocking has been achieved.

Peak Flow. The highest amount of stream or river flow occurring in a year or from a single storm event.

Perennial Streams. Streams that flow continuously throughout the year.

Prescribed Burning. The intentional application of fire to wildland fuels in either their natural or altered state. Burning is conducted under such conditions as to allow the fire to be confined to a predetermined area and to produce an intensity of heat and rate of spread required to meet planned objectives (e.g., silvicultural, wildlife management, reduction of fuel hazard, etc.).

Prescription. Management practices selected and scheduled for application on a designated area to attain specific goals and objectives.

Reforestation. The natural or artificial restocking of a forest area with trees--includes measures to obtain natural regeneration, as well as tree planting and seeding. Reforestation is used to produce timber and other forest products, protect watershed functioning, prevent erosion, and improve other social and economic values of the forest, such as wildlife, recreation, and natural beauty.

Regeneration Harvest. A silvicultural system using stand regeneration methods that include modified versions of the seed tree, shelterwood and overstory removal harvest methods. Stands remaining after regeneration harvest will generally resemble reserve seed tree cuts.

Resource Management Plan (RMP). A land use plan prepared by the BLM under current regulations in accordance with the Federal Land Policy and Management Act. (See USDI, BLM 1995).

Riparian Areas/Habitats. Areas of land that are directly affected by water, usually having visible vegetation or physical characteristics reflecting the influence of water. Streambanks, lake edges, or marshes are typical riparian areas.

Riparian Reserves. Designated riparian areas found outside Late-Successional reserves.

Riparian Zone/Habitat. Those terrestrial areas where the vegetation complex and microclimate conditions are products of the combined presence and influence of perennial and/or intermittent water, associated high water tables and soils which exhibit some wetness characteristics. Normally used to refer to the zone within which plants grow rooted in the water table of these rivers, streams, lakes, ponds, reservoirs, springs, marshes, seeps, bogs and wet meadows.

Sediment. Any material carried in suspension by water, which would ultimately settle to the bottom. Sediment has two main sources: from the water channel itself and from disturbed upland sites.

Slash. The residue on the ground following felling and other silvicultural operations and/or accumulating there as a result of a storm, fire girdling, or poisoning of trees.

Snag. A standing dead tree usually without merchantable value for timber products, but having characteristics of benefit to cavity nesting wildlife species.

Soil Compaction. An increase in bulk density (weight per unit volume) and a decrease in soil porosity resulting from applied loads, vibration, or pressure.

Soil Productivity. Capacity or suitability of a soil for establishment and growth of a specified crop or plant species, primarily through nutrient availability.

Surface Erosion. The detachment and transport of soil particles by wind, water, or gravity. Surface erosion can occur as the loss of soil in a uniform layer (sheet erosion), in many rills or dry rattle.

Underburning. The use of prescribed fire, most often below an overstory canopy to remove excess forest fuels. Generally conducted in the spring months and a cooler fire than broadcast burning.

Yarding. The act or process of moving logs to a landing.

APPENDIX 1 - ALTERNATIVE DEVELOPMENT SUMMARY

Environmental Assessment Number OR-118-04-014

Pursuant to Section 102 (2) (E) of NEPA (National Environmental Policy Act of 1969, as amended), Federal agencies shall “Study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources.” The CEQ (Council on Environmental Quality) regulations for implementing the procedural provisions of NEPA states, alternatives should be “reasonable” and “provide a clear basis for choice” (40 CFR 1502.14).

In light of the direction contained in both NEPA and the CEQ Regulations, the following questions were used to 1/ identify the alternatives to be analyzed in detail in this environmental assessment that are in addition to the “proposed action” and “no action” alternatives, and 2/ document the rationale for eliminating alternatives from detailed study.

- 1. Are there any unresolved conflicts concerning alternative uses of available resources? If yes, document and go to Question #2. If no, document rationale and stop evaluation.**

The Glendale Resource Area has received comment letters from the public identifying two primary concerns, road construction and removal of late successional habitat. Concerns identified regarding road construction (permanent or temporary) are loss of soil productivity and increased risk of sediment delivery to streams. Concerns identified with removal of late-successional habitat are loss of habitat for species such as the northern spotted owl.

- 2. What alternatives should be considered that would lessen or eliminate the “unresolved conflicts concerning alternative uses of available resources”? List alternatives and go to Question #3. If no alternative is identified other than the “no action” alternative, document and stop evaluation.**

An alternative could be developed that would avoid road construction and removal of late successional habitat.

- 3. Of those alternatives identified in Question #2, are there reasonable alternatives for wholly or partially satisfying the need for the proposed action? If so, briefly describe alternatives and go to question #4. If no, document rationale and stop evaluation.**

Yes, the alternative described in the table below would partially satisfy the need for action as described in Chapter 1.

Matrix		
	Alt.2 Proposed Action	Alt. 3
Number of units	6	3
Acres of RH/OR	29	0
Acres of NDNM/fuels	586	586
Acres of CT	28	0
Total treatment acres in Matrix	643	586
Acres of tractor	0	0
Acres of cable	16	0
Acres of helicopter	41	0
Roads		
• decommission (mi.)	0	0
• block/gate	1.20	1.20
• new temp (mi)	0	0
Late Successional Reserve		
	Alt.2 Proposed Action	Alt. 3
Number of units	40	37
Acres of CDM	447	356
Acres of NDNM	361	361
Total treatment acres in LSR	808	717
Acres of tractor	53	53
Acres of cable	394	303
Acres of helicopter	0	0
Roads		
• decommission (mi.)	0.80	0.80
• block/gate	0.54	0.54
• new temp (mi)	0.88	0

RH/OR = Regeneration Harvest/ Overstory Removal
CDM = Commercial Density Management
NDNM = Non-commercial Density Management
CT = Commercial Thin

This alternative (Alternative 3) avoids road construction and does not remove late-successional habitat. In summary, any units without access would be helicopter logged if economically feasible or deferred at this time. As a result, 124 acres of treatment would be deferred including a unit proposed for commercial thinning in General Forest Management Lands. However, selection of alternative 3 would not constitute a decision to reallocate these lands to non-commodity uses. Future forest management treatments in this area would not be precluded and could be analyzed under subsequent environmental analysis.

4. **Of those alternatives identified in Question #3, will such alternatives have meaningful differences in environmental effects?** If so, seek line officer approval to carry alternatives forward for detailed analysis in the environmental assessment. If no, document rationale and stop evaluation.

Yes, see Chapter 3 in the Environmental Assessment for a complete disclosure of the environmental effects.

APPENDIX 2 - ENVIRONMENTAL ELEMENTS

Environmental Assessment Number EA# OR-118-04-014
Slim Jim Project

In accordance with law, regulation, executive order and policy, the interdisciplinary team reviewed the elements of the human environment to determine if they would be affected by the alternatives described in Chapter 2 of the EA (environmental assessment). The following three tables summarize the results of that review. Those elements that are determined to be “affected” will define the scope of environmental concern, Chapter 3 of the EA.

Table 1. Critical Elements of the Environment. This table lists the critical elements of the human environment (BLM Handbook 1790-1) which are subject to requirements specified in statute, regulation, or executive order and the interdisciplinary team predicted environmental impact per element if the action alternatives described in Chapter 2 of the Environmental Assessment were implemented.		
Critical Element of the Human Environment	Status 1/ Not Present 2/ Not Affected 3/ Affected	Interdisciplinary Team Remarks 1/ If not affected, why? 2/ If affected, develop cause/effect statement, unit of measure to describe environmental impacts, and if applicable, design features not already identified in Appendix D of the RMP to reduce or avoid environmental harm
Air Quality (Clean Air Act)	Not Affected	The Planning Area is not located within a Class I designated airshed or non-attainment area. Dust created from vehicle traffic on gravel or natural-surfaced roads, road construction and logging operations would be localized and of short duration. Hazardous and activity fuels would be burned in accordance with the <i>Oregon State Implementation Plan, Oregon Smoke Management Plan and Visibility Improvement Plan</i> . The impact of smoke on air quality is expected to be localized and of short duration. Particulate matter would not be of a magnitude to harm human health, affect the environment, or result in property damage. As such, the Proposed Action is consistent with the provisions of the Federal Clean Air Act.
Areas of Critical Environmental Concern	Not Present	There are no Areas of Critical Environmental Concern located within the project area.
Cultural, Historic, Paleontological	Not Present	Cultural resource surveys were conducted fall 2004. No cultural resources were identified in any areas effected by the proposed project. Guidelines for the survey are set forth by Section 106 of the National Historic Preservation Act (NHPA). Surveys were conducted using Oregon State Historic Preservation Office (SHPO) standard protocol. Project design features identified in the Slim Jim EA are present to protect archaeological sites in case they are inadvertently uncovered. If any areas are accidentally uncovered during project implementation project operations would avoid these sites. Should avoidance be impractical, then the affected sites would be formally evaluated and impacts to them may need to be mitigated through further study.
Energy (Executive Order 13212)	Not Affected	Galesville Dam is located within the planning area. The proposed action will have no effect on energy development, production, supply and/or distribution.

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Environmental Justice (Executive Order 12898)	Not Affected	The proposed action is not anticipated to have disproportionately high and adverse human health or environmental effects on minority populations and low-income populations.
Prime or Unique Farm Lands	Not Affected	Prime or unique farmlands within Upper Cow Creek watershed, would not be entered, or altered, as a result of this project. See water resources for a discussion of hydrologic timing and flows.
Flood Plains (Executive Order 11988)	Not Affected	Floodplains have been buffered out of this project area with regards to occupancy, treatments, or modification. There will be no measurable difference in the timing or magnitude of the peak flows, and therefore no increase the risk of flood loss. As such, the proposed action is consistent with Executive Order 11988. See water resources for more details on peak flows.
Hazardous or Solid Wastes	Not Present	The proposed action would not create any hazardous or solid waste.

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Invasive, Nonnative Species (Executive Order 13112)	Not Affected	<p>Units within the Slim Jim Planning Area were surveyed for noxious weeds in the spring of 2004. Although the Planning Area is known to have invasive weeds along many roadsides, only three noxious weed species, Meadow knapweed (<i>Centaurea pratensis</i>) (3 sections), scotchbroom (<i>Cytisus scoparius</i>) (1 section), and Tansy ragwort (<i>Senecio jacobaea</i>) (2 sections), were found within the proposed treatment units.</p> <p>Project Design Features (PDFs) have been established to mitigate the potential spread of weeds, and include such measures as washing equipment prior to moving it on-site, operating vehicles/equipment in the dry season, and seeding newly created openings with native grass/forb mix so they can become established before the invasive weeds have a chance to germinate. Construction of 0.88 miles of temporary roads, one helicopter landing, and the use of 23.5 acres of existing yarding corridors would create 27.8 acres of soil disturbance. As stated above, these areas would be seeded with native grass/forb to greatly reduce the invasion of noxious weeds into these areas. Additionally, in the long term, after canopies have filled in and vehicular traffic has subsided to normal levels, weed infestations are likely to level off. In cases where canopy cover is re-established, weed populations are expected to decline, as the amount of light reaching the plants diminishes.</p> <p>The effects of the proposals on the spread of noxious weeds are negligible, for a variety of reasons. First, noxious weeds were only found to cover 0.007 acres, or 0.00048% of the units; these numbers suggest the possibility of infestations reaching uncontrollable levels is not probable. Second, sites noted in the project area units have been reported, and will be eradicated in the near future, whether or not this project goes forward. The anticipated impacts of noxious weeds are within the scope of those analyzed in the Medford District RMP EIS. The Medford District BLM Noxious Weed Plan and ongoing weed program are utilized to eradicate known noxious weed populations reported by BLM contractors, botanists, and other field-going personnel. Third, PDFs have been established to minimize the potential of spreading noxious weed seed from outside/adjacent sources. Monitoring would occur in conjunction with project implementation, in an effort to ensure compliance with the PDFs.</p>
Native American Religious Concerns	Not Present	The project area is located within the traditional territory of the Cow Creek Band of Umpqua Indians and descendants of the original inhabitants still live in this area. The Tribe has not identified any concerns.

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T/E (Threatened or Endangered) Fish Species or Habitat	Not Affected	<p>In the Alsea Valley Alliance vs. Evans District Court case (2001), Judge Hogan issued an Opinion that, “The August 10, 1998 NMFS listing decision [Oregon Coast coho salmon], contained at 63 Federal Register 42,857, is declared unlawful and set aside as arbitrary and capricious.” ONRC (Oregon Natural Resources Council) et al. subsequently appealed and requested a stay of Hogan’s opinion. That stay was granted by the Ninth Circuit Court pending appeal. On February 24, 2004 the Ninth Circuit Court ruled on the appeal. Based on this ruling, the original Hogan opinion is in effect until such time as NOAA Fisheries (NMFS) proposes a new listing decision in the Federal Register which deals with the issue of hatchery coho. OC Coho salmon are therefore considered at this time to be candidate T&E species.</p> <p>Additionally, located at the base of Upper Cow Creek watershed is Galesville Dam. This structure is a complete barrier to anadromous fish passage. It is currently proposed under the Northwest Regions Federal Register, that if the OC coho salmon are re-listed under the August 2005 NWR Federal Register, critical habitat will only occur below Galesville Dam.</p> <p>Currently, adult OC coho salmon and winter steelhead are planted by ODFW on a regular basis in Galesville reservoir for sport fishing. Winter steelhead are candidate T/E species. However neither of these species above Galesville Dam are considered to be part of the threatened Evolutionary Significant Unit (ESU), since they are artificially planted and landlocked, making it impossible for juvenile fish to migrate downstream to complete their lifecycle and contribute to the recovery of the species. As a result, there are no T&E anadromous species in Upper Cow Creek watershed. The hazardous fuels treatment located in the adjacent Evans Creek watershed does not require consultation with NOAA Fisheries as the treatments in Unit 30-1C would have no effect on Southern Oregon/Northern California coho salmon (ESA-listed as Threatened). Project Design Features, combined with treatment technique and location, would prevent sediment from entering streams and from altering peak flow in the species' nearest habitat, 1.3 miles downstream in Evans Creek.</p> <p>No other T/E fish species occur within this watershed.</p>

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T/E (Threatened or Endangered) Plant Species or Habitat	Not Present	Of the four federally listed plants on the Medford District (<i>Fritillaria gentneri</i> , <i>Limnanthes floccosa</i> ssp. <i>grandiflora</i> , <i>Arabis macdonaldiana</i> and <i>Lomatium cookii</i> , only <i>Fritillaria gentneri</i> has a range and habitat which extends into the Glendale Resource Area. The project area addressed in this document is outside the range and habitat of <i>F. gentneri</i> , as determined by the US Fish and Wildlife Service. Vascular plant surveys were conducted in the spring of 2004, and no <i>Fritillaria gentneri</i> populations were found. There will be no effect from the proposed action on any federally listed plant.
T/E (Threatened or Endangered) Wildlife Species, Habitat and/or Designated Critical Habitat	Affected (NSO & Fisher Habitat including NSO Critical Habitat)	<u>Affected:</u> The action alternatives would impact suitable habitat for the NSO (northern spotted owl), Threatened, and fisher (Candidate). The unit of measure is the acres of suitable habitat removed, degraded or downgraded and a narrative description of impacts to the function of CHU (critical habitat unit) OR-32. Design features are those contained within the Terms and Conditions of the Biological Opinion #1-14-03-F-511 such as seasonal and daily time restrictions. <i>Refer to Section 3.3 of the EA for a discussion of the affected environment and environmental effects of the alternatives related to this element of the environment.</i>
	Not Affected (Disturbance: NSO & Bald Eagle)	<u>Not Affected:</u> Logging activities occurring during spotted owl nesting season are not expected to disturb owls within 195' of nesting habitat (App. A p. 4 FY 04-08 USFWS Biological Opinion). Seasonal logging restrictions would be applied to protect known bald eagles and spotted owl sites to avoid disturbance from noise.
	Not Present (MAMU and Fisher)	<u>Not Present:</u> Marbled murrelets (MAMU) are not present within the Planning Area. The action alternatives would not occur within designated marbled murrelet critical habitat. The fisher is a Candidate species. There are no known sightings of the fisher within or near the project area. Some surveys have been conducted with no detections. The fisher was analyzed in the Northwest Forest Plan (NFP) and failed to pass the species viability screens due to its dependence on interior forest habitat and large, down woody debris. The action alternatives would not change the trend predicted in the NFP.

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Water Quality (Surface and Ground)	Affected (Sediment/ Turbidity)	<p><u>Affected:</u> The action alternatives (e.g., log haul roads, yarding, temporary road construction, and road decommissioning) would result in soil disturbance, thereby increasing the potential for soil erosion and increases in short-term, localized turbidity and sedimentation in streams. The unit of measure is a narrative on whether an action would cause sedimentation to streams that would be in excess of the Environmental Protection Agency’s criteria for surface water quality standards under 304 a(1) of the Clean Water Act. <i>Refer to Section 3.4 of the EA for a discussion of the affected environment and environmental effects of the alternatives related to this element of the environment.</i></p>
	Not Affected (Temperature & Chemical/Nutrient Contamination)	<p><u>Not Affected:</u> Streams in the project area are generally well shaded on public lands. Where thinning occurs within the riparian zone, substantial portions of the riparian canopy will be retained, thereby maintaining riparian microclimate conditions and protecting streams from further increases in temperature. See Section 2.3.6 “Streams and Riparian Zones” for design features used to ensure stream temperature would be maintained, or improved in accordance with ACS objectives.</p> <p>A total of 11.6 miles on Cow Creek and Snow Creek are listed on the DEQ 303(d) list for temperature within this project area. This is not expected to change because non-federal ownership provides a lower level of protection to riparian areas along these streams that often does not allow for optimal shade conditions to be achieved.</p> <p>Galesville Reservoir is listed for mercury. No herbicides or pesticides would be used in conjunction with this project. Fueling of equipment would not occur within Hydraulic fluid and fuel lines on heavy mechanized equipment would be in proper working condition in order to minimize potential for leakage into streams. No re-fueling of any equipment would occur within 150ft of streams or stream crossings. Due to these design features it would not be expected for the proposed action to have any affect on chemical contamination.</p> <p>Hand-pile and under-burning could increase nitrogen levels within the stream and riparian zone in the short term. These would be highly localized, low level increases and would not be expected to be large enough to have any adverse on water quality.</p> <p>There are no known groundwater aquifers in the project area.</p>

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Wetlands (Executive Order 11990)	Not Affected	The only known wetland on BLM lands within this project area is located in T31S-R3W-7N. It is less than one acre in size. There are no project activities being proposed in the northern portion of section 7. Should any additional wetlands be discovered within the project area during project implementation, they will be buffered, as required by the Medford RMP, to ensure protection of all ecological functions. Therefore the proposed action will not result in the destruction, loss or degradation of any wetland. As such, the proposed action is consistent with Executive Order 11990.
Wild and Scenic Rivers	Not Present	
Wilderness	Not Present	

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Other Elements of the Environment	Status 1/ Not Present 2/ Not Affected 3/ Affected	Interdisciplinary Team Remarks 1/ If not affected, why? 2/ If affected, develop cause/effect statement, unit of measure, and if applicable, design features not already identified in Appendix D of the RMP to reduce or avoid environmental harm
Essential Fish Habitat (Magnuson-Stevens Fisheries Conservation and Management Act)	Not Affected	No anadromous fish can occur in the portion of Slim Jim project above the Galesville dam since it is a complete barrier to fish passage. Thus the area above the dam is not considered EFH under the Magnuson-Stevens Fisheries Conservation and Management Act. The portion occurring in the Evans Creek watershed (below the dam) would not affect EFH (Essential Fish Habitat) for Southern Oregon/Northern California Coho salmon. Project design features, combined with treatment technique and location, would prevent sediment from entering streams and from altering peak flow in the species' nearest habitat, 1.3 miles downstream in Evans Creek.
Fire Hazard/Risk	Affected	The action alternatives would create activity fuels that would increase fire risk until the fuels were treated and would treat existing fuels which would decrease fire risk within the planning area. Additionally, some stands (e.g., regeneration harvest and overstory removal treatments) under Alternative 2 will have an increase in flammability after treatment and until the stands develop into an older age class. The units of measure are a narrative and acres treated. <i>Refer to Section 3.2 of the EA for a discussion of the affected environment and environmental effects of the alternatives related to this element of the environment.</i>

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Late-Successional Forest	Proposed action is in compliance with the 15% Standard and Guideline	Federal ownership of late-successional forest is approximately 49% (USDI 2005) of the entire Upper Cow Creek watershed. The Northwest Forest Plan standards and guidelines state that at least 15% of fifth field watersheds should be managed to retain late-successional patches (ROD, C-44). Harvest from other recent federal timber sales would remove approximately 57 acres of late-successional forest. The cumulative removal of late-successional forest under Alternative 2, and these recent timber sales, is approximately 4.7% of matrix late-successional lands within the Upper Cow Creek watershed. As such, Alternative 2 is in compliance with the 15% Standard and Guideline.
Port Orford Cedar	Not Present	Project area is outside the natural range of Port-Orford-cedar.
Recreation	Not Affected	The planning area is within a Special Recreation Management Area (SRMA), with 3 units (totaling 76 acres of CT/NDNM) within view of the Galesville Reservoir. Prescriptions are written to protect the visual appearance within Galesville SRMA guidelines and are consistent with the VRM classifications within the project area. A temporary increase in noise would be apparent during logging activities between June 15 th and October 15 th . Increased use of roads by logging trucks would increase the hazard for pedestrians and bicyclists along 4 miles of Snow Creek road and 13.5 miles of Upper Cow Creek road. Project Design Features have been developed (Section 2.3.8), to minimize this impact through resident notification of increased traffic along Snow and Cow Creek roads.
Rural Interface Areas	Not Present	There are no Medford District RMP designated Rural Interface areas within the planning area.
Special Areas (not including ACEC)	Not Present	
Special Status Species (not including T/E): Fish Species/Habitat	Not Present	No known special status species in this watershed.
Special Status Species (not including T/E): Plant Species/Habitat	Not Present	Vascular plant surveys were conducted in the spring of 2004, surveys were completed in the winter of 2004 for lichens and bryophytes. Using intuitive controlled methodology, professional botanists surveyed the project area units; areas supporting high potential habitat were surveyed more intensively. Surveys did not reveal any bureau special status vascular plant sightings. Nonvascular surveys resulted in one sighting of <i>Tortula subulata</i> , found in unit 1-4. This species is a Bureau Tracking species, and does not require mitigation pursuant to Bureau policy.

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Special Status Species (not including T/E): Plant Species/Habitat (continued)	Not Present	<p>The project area was not surveyed for fungi, as pre-disturbance surveys for Special Status fungi are not practical, nor required per BLM – Information Bulletin No. OR 2004-121, which states “If project surveys for a species were not practical under the Survey and Manage standards and guidelines (most Category B and D species), or a species’ status is undetermined (Category E and F species), then surveys will not be practical or expected to occur under the Special Status/Sensitive Species policies either (USDA FS and USDI BLM, 2004, p.3).” Current special status fungi were formerly in the aforementioned S&M categories which did not consider surveys practical, and are therefore exempt from survey requirements.</p> <p>District wide, the Medford BLM has ten Bureau Sensitive (BSO) fungi species; seven are suspected to occur here, while the remaining three have been documented. Of the three documented species, only one, <i>Phaeocollybia olivacea</i>, has been found in the Glendale Resource Area, approximately 15 air miles away from the project area. The typical habitats encountered in the Slim Jim project area differ from those of the <i>P. olivacea</i> site, which is riparian-influenced, and reflects a tanoak/canyon liveoak/Douglas fir/Oregon grape species composition. Slim Jim units receive more precipitation, and consequently, harbor more of a salal/rhododendron component, and lack the tanoak component. Based on the outcome of utilizing the ‘Likelihood of Occurrence Key’ provided from the BLM Oregon State Office, there is a “low likelihood of occurrence and low risk to species viability or trend toward listing,” for sensitive fungi species potentially located in the project area.</p> <p>While it is possible that this project is occurring within potential habitat for some species, there is very little information available describing the exact habitat requirements or population biology of these species (USDA,USDI 2004 (2004 Final SEIS vol.1) p. 148). The 2004 FEIS to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines addresses this type of incomplete and/or unavailable information (USDA, USDI 2004, pp 108-109). However, the 2004 <i>Record of Decision (ROD) to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines</i>, offers a broad-scale prospective of this current situation in stating, “Any discussion of risk based on rarity and likelihood of disturbance must recognize that, for many species, only a small percentage of potential habitat has been surveyed. Reserves have not been surveyed to the same degree as Matrix and Adaptive Management Area land allocations. The Reserves were not</p>

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Other Elements of the Environment	Status 1/ Not Present 2/ Not Affected 3/ Affected	Interdisciplinary Team Remarks 1/ If not affected, why? 2/ If affected, develop cause/effect statement, unit of measure, and if applicable, design features not already identified in Appendix D of the RMP to reduce or avoid environmental harm
Special Status Species (not including T/E): Plant Species/Habitat (continued)	Not Present	<p>surveyed because there has been little management-induced disturbance there. The vast majority of pre-disturbance surveys have been located in the Matrix and Adaptive Management Area land allocation (19 percent of the northwest Forest Plan area), so that is where many of the known sites would also provide, at a minimum, its proportionate share of the habitat to support populations of these species (2004 ROD to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines, p.11).”</p> <p>Based on the above information, the likelihood of a Bureau Sensitive fungi species in this project area is very low; the likelihood of a sensitive fungi occurring within a single unit(s) encompassed in the project area is even lower. The likelihood of contributing toward the need to list is not probable.</p>

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Other Elements of the Environment	Status 1/ Not Present 2/ Not Affected 3/ Affected	Interdisciplinary Team Remarks 1/ If not affected, why? 2/ If affected, develop cause/effect statement, unit of measure, and if applicable, design features not already identified in Appendix D of the RMP to reduce or avoid environmental harm
Special Status Species (not including T/E): Wildlife Species/Habitat	Not Affected (goshawk, pond turtle, Oregon shoulderband snail, fringed myotis, pacific pallid bat, tailed frog, and foothill yellow legged frog)	<p>Not Affected: Bureau Sensitive: Goshawk – No known sites within the project area, goshawk has been observed near Azalea and is likely to occur within the 5th field watershed. Removal of 29 acres of late successional habitat, and thinning of 28 acres of late successional habitat on Matrix land would reduce habitat suitable for nesting. There is sufficient mix of seral stages including large trees in the project area, including late successional reserve, and deferred or withdrawn habitat within Matrix to provide nesting, fledging, and foraging habitat. 925 acres of commercial thinning, non-commercial density management, and fuels treatment would promote development of suitable habitat by opening understories. Viability rating would remain high and unchanged. (USDA/USDI 1994a 3&4 p179).</p> <p>Bureau Sensitive: Pond turtle- Occurs in Galesville Reservoir, Cow Creek, and major tributaries. The Aquatic Conservation Strategy, Riparian Reserves, and LSR guidelines are expected to provide and maintain adequate habitat in the proposed project area and 5th field watershed. Oregon shoulderband snail – occurs in the project area, typical exposed bedrock/ deep talus, or mixed oak/conifer grassland habitat would not be removed or suitability degraded</p> <p>Bureau Assessment: fringed myotis bat and Pacific pallid bat – No known sites in the proposed project area or 5th field watershed. The fringed myotis occurs in adjacent Middle Cow 5th field watershed. The species ranges in western North America from British Columbia to Mexico. The Aquatic Conservation Strategy, Riparian Reserves, and late successional reserve management guidelines are expected to maintain and develop adequate habitat in the Upper Cow Creek 5th field watershed. Some suitable snags may be removed due to safety concerns, in the removal of 29 acres of late-successional habitat, and thinning of 28 acres of late-successional habitat. No caves/ rock structures with crevices supporting roosting or hibernacula would be disturbed. The viability level would be maintained as the NFP with Standards and Guidelines would provide 80% or greater likelihood of sufficient distribution of habitat (1994a p.3&4-187).</p>

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Other Elements of the Environment	Status 1/ Not Present 2/ Not Affected 3/ Affected	Interdisciplinary Team Remarks 1/ If not affected, why? 2/ If affected, develop cause/effect statement, unit of measure, and if applicable, design features not already identified in Appendix D of the RMP to reduce or avoid environmental harm
Special Status Species (not including T/E): Wildlife Species/Habitat (continued)	Not Present (all other species)	<p>Bureau Assessment: The tailed frog is documented in Snow Creek and Whitehorse Creek, and probably occurs in other perennial streams bordered with late successional forested. It is expected to occur in perennial high gradient streams with cobble, boulders, large down wood, high canopy closure, within late-successional habitat. The proposed project is not expected to affect this species, since any management within riparian reserves is not expected to degrade habitat conditions.</p> <p>Bureau Assessment: The foothill yellow legged frog occurs in Galesville Reservoir, and in small ponds adjacent to the reservoir, and in Cow Creek. The proposed project is not expected to affect this species since all ponds will receive a no treatment buffer of two site-potential trees or 300ft slope distance, whichever is greatest. Riparian reserve management and Aquatic Conservation Strategy would maintain habitat conditions.</p> <p><u>Not Present:</u> Northern red-legged, American peregrine falcon, black-backed woodpecker, flammulated owl, Lewis' woodpecker, three-toed woodpecker, white-headed woodpecker, Siskiyou short-horned grasshopper, Townsend's big-eared bat, Chase sideband (snail), Siskiyou Hesperian, travelling sideband (snail), and white-tailed kite.</p> <p>Consistent with Bureau policy (IM OR-2003-054) Bureau tracking species are not considered a special status species for management purposes.</p>
Soil (productivity, erodibility, mass wasting, etc.)	Affected	The action alternatives (e.g., yarding, temporary road construction, road decommissioning, and fuels reduction) will result in soil compaction/disturbance that may reduce soil productivity. The unit of measure is a narrative description of productivity, erosion and mass wasting. <i>Refer to Section 3.4 of the EA for a discussion of the affected environment and environmental effects of the alternatives related to this element of the environment.</i>

Table 2. Other Elements of the Environment. This table lists other elements of the environment which are subject to requirements specified in law, regulation, policy, or management direction and the interdisciplinary teams predicted environmental impact per element if the alternatives described in Chapter 2 of the Environmental Assessment were implemented.

Other Elements of the Environment	Status 1/ Not Present 2/ Not Affected 3/ Affected	Interdisciplinary Team Remarks 1/ If not affected, why? 2/ If affected, develop cause/effect statement, unit of measure, and if applicable, design features not already identified in Appendix D of the RMP to reduce or avoid environmental harm
Visual Resources	Not Affected	<p>The Planning area is located within VRM (Visual Resource Management) Class II-IV category lands. These VRM categories allow for varying amounts of modifications to the existing character of the landscape. The 3,977 acre Galesville Special Recreation Management Area (SRMA) is classified as VRM Class II lands.</p> <p>Units 11-1, 28-1, 34-1, and 27-1 are located within the Galesville SRMA and can be seen from the Reservoir. Project Design Features, located in Chapter 2 of this document, have been created for these units, and will ensure compliance with Medford District Resource Management Plan's VRM guidelines.</p> <p>The activities proposed for the remaining units conform with the VRM Classifications for those lands.</p> <p>Visual Resource Management Contrast Rating Sheets have been created for each management action and are located within the Project File Record.</p>

Table 2. Other Elements of the Environment. This table lists other elements of the environment which are subject to requirements specified in law, regulation, policy, or management direction and the interdisciplinary teams predicted environmental impact per element if the alternatives described in Chapter 2 of the Environmental Assessment were implemented.

Other Elements of the Environment	Status 1/ Not Present 2/ Not Affected 3/ Affected	Interdisciplinary Team Remarks 1/ If not affected, why? 2/ If affected, develop cause/effect statement, unit of measure, and if applicable, design features not already identified in Appendix D of the RMP to reduce or avoid environmental harm
Water Resources (not including water quality)	Not Affected	<p>The proposed action is not anticipated to have a measurable effect on watershed hydrology, or beneficial uses associated with the quantity or timing of water within this project area. Designated beneficial uses in this project area include private water supplies, irrigation, industrial water supplies, livestock watering, boating, resident fish and aquatic life, fishing, and swimming. These beneficial uses will not be affected because the maximum amount of effective open area created by either alternative would be limited to 16 acres of regeneration harvest, 13 acres of overstory removal, 28 acres of commercial thin, 473 acres of commercial density management treatments, all of which will be dispersed over the 16,225 acre project area.</p> <p>Within the transient snow zone, proposed treatment areas would also be disperse, and with the exception of 13 acres of overstory removal in unit 30-1, all treatments within the transient snow zone would be commercial density management/thins, non-commercial density management, or fuels treatments, all of which would leave canopy closures of at least 30-60 percent. This project design feature would reduce the likelihood of increased runoff during rain-on-snow events considerably, putting the risk of flow enhancement from this project in the low risk category (OWEB, pg IV-11). Roads currently occupy 1.84% of the watershed. According to a studies by Bowling and Lettenmaier (1997), Harr et al. (1975) and others, measurable increases in peak flows are generally not seen until roads occupy at least 3-4% of the watershed (Harr et al. found that 12% is necessary). There are no new permanent roads proposed under this project. A maximum of 0.88 miles of new temporary road is proposed under Alternative 2 for access to some treatment areas which would otherwise need very long yarding corridors, or be left untreated. In Alternative 3 these units would not be untreated. Adding 0.88 mi of temporary road would increase the percent of roaded ground by only 0.02% within this sixth-field watershed Thus it would not be expected that any activity associated with this project would cause a measurable difference in the timing or magnitude of the peak flows, or by extention, in the quantity of ground water storage.</p> <p>Beneficial uses would further be protected by riparian buffers which would be placed on all streams and springs to protect all ecological and biological functions along streams and springs, as required under the NWFP and the Medford RMP. Harr (1976) found that patch cutting within a watershed, combined with riparian buffers of 50-100 feet can reduce increases in water yield. Localized changes in water quantity in small, isolated springs within units could occur as stocking levels change during the first decade. However since no water rights occur within, or immediately below, these units, this will have no affect on beneficial uses.</p>

Table 3. Aquatic Conservation Strategy Summary. This table lists the four components of the Aquatic Conservation Strategy and the interdisciplinary teams predicted environmental impact per component if the alternatives described in Chapter 2 of the Environmental Assessment were implemented.

Components	Consistency with ACS	Remarks /References
Riparian Reserves	Consistent	Habitat will be improved through treatments designed to reduce the occurrence of tightly spaced, even aged stands, and promote the creation of late-successional characteristics and future large woody debris. Current shade cover will be retained on streams. Wetlands will not be affected. Also refer to Chapter 2 for Project Design Features consistent with the NFP and Medford District RMP.
Key Watershed	Consistent	The proposed action is not located within a Tier 1 Key watershed.
Watershed Analysis	Consistent	Upper Cow Creek Watershed Analysis, 2005. Watershed Analysis recommendations included in the design of the action alternatives include thinning stands to promote the creation of late-successional characteristics, reducing hazardous fuels, reducing road density through decommissioning, gating and barricading, and maintaining roads to minimize sedimentation.
Watershed Restoration	Consistent	<u>Control and prevention of road related run-off and sediment production:</u> The action alternatives entail road maintenance and net road mileage reduction within the watershed that in the long-term will reduce road related run-off and sediment production. <u>Restoration of the condition of Riparian vegetation:</u> Riparian Reserves will be thinned to promote the creation of late-successional characteristics on an accelerated timeframe. This will occur with no new road construction, or ground-based equipment off of existing roads/trails within Riparian Reserves.

*Harr, R.D.. 1976. Forest Practices and Streamflow in Western Oregon. USDA Forest Service General Technical Report PNW-49. Pacific Northwest Forest and Range Experiment Station, Portland, Oregon.

Appendix 3 - Slim Jim Forest Development Project

INTRODUCTION

The Slim Jim project proposes forest and stand development treatments, timber harvest, fuels reduction treatments, and follow-up vegetation treatments (e.g., site preparation, planting of conifers, maintenance treatments, protection treatments, spacing of residual regeneration, and associated treatments to reduce activity fuels) in 46 units within the Upper Cow Creek watershed. One unit is partially within the Upper West Evans Creek watershed. This watershed is listed as a deferred watershed. This prescription assesses stand conditions and recommends treatments for selected stands within the project area. Treatment within Late Successional Reserves is proposed so that desired late Successional stand characteristics can develop, desired stand components may be retained, and to promote stand growth/vigor. Removal of commercial size conifers as a by-product of the treatment is proposed for some of these areas. Harvest within Matrix stands is proposed. Matrix lands have timber production as an objective. Riparian reserves are being proposed for treatment under this project. Areas proposed for treatment are outside of any Tier 1, Key watersheds. Areas proposed for treatment are outside of the natural range of Port-Orford-cedar.

Stands proposed for treatment can be categorized as being Mixed Conifer as described by Franklin and Dyrness in Natural Vegetation of Oregon and Washington (1973). Douglas -fir is the primary conifer species. Ponderosa pine, sugar pine, and incense cedar occur within the project area. Primary hardwood and shrub species include Pacific madrone, golden chinquapin, canyon live oak, rhododendron, and salal.

OBJECTIVES

Land Use Allocation Objectives:

(As described in the Record of Decision and Resource Management Plan for the Medford District 1995)

Objectives for lands allocated to Late Successional Reserve:

- Protect and enhance conditions of late-successional and old-growth forest ecosystems, which serve as habitat for late-successional and old-growth forest-related species including the northern spotted owl and marbled murrelet.
- Maintain a functional, interacting, late-successional and old-growth forest ecosystem.

Objectives for lands allocated to Matrix:

- Production of a sustainable supply of timber and other forest commodities,

- Providing connectivity (along with other allocations such as riparian reserves) between Late-Successional Reserves
- Providing habitat for a variety of organisms associated with both late-successional and younger forests,
- Providing for important ecological functions, and
- Providing early successional habitat.

Objectives for lands allocated to Riparian Reserve:

- The objectives of the Aquatic Conservation Strategy.
- Provide habitat for terrestrial species associated with late-successional forest habitat.
- Provide dispersal habitat for northern spotted owls.
- Implement strategies to achieve the goals established in the BLM's Riparian Wetland Initiative for the 1990s

Unit Specific Objectives

Commercial Density Management Units (CDM): 25N-1, 25N-2a, 25N-3, 25N-4, 27-1, 1-1a, 1-3a, 1-3b, 1-3c, 1-3d, 1-4, 3-1, 11-1, 13-1a, 13-2y, 19N-2, 19N-3a, 19N-7, 29-2a, 7-2, 17-1a, 18-1a, 18-2

The objective of Commercial Density Management treatments within these units is to reduce stand densities so that the competition for light, water, nutrients and growing space is decreased on desired leave trees. Density management treatments would be designed to enhance and promote desired stand characteristics for wildlife or other non-production objectives. Desired stand characteristics for late-successional wildlife include: large diameter trees, trees with large branches and full crowns, plant species diversity, and structural diversity. Long-term stand vigor and growth (forest health) within these stands are a concern. Reduction of stand densities would promote long-term stand vigor and growth. While wood volume would result from the treatment, production of wood volume at the present time or for the future is not a primary objective. Wood volume produced would be a by-product of the treatment. These units are allocated to Late-Successional Reserve (LSR) by the NW Forest Plan.

Commercial Density Management / Smallwood (CDM/SW): 28-1, 34-1

The objective of Commercial Density Management / Smallwood (CDM/SW) treatments is the same as that for CDM treatments, to reduce stand densities. Treatments would be designed to enhance and promote desired stand characteristics for wildlife or other non-production objectives. Treatments would be designed to promote long-term stand vigor and growth. Trees within these stands are of such a size that recovery of commercial product may not be economically possible. Production of wood volume at the present time or for the future is not a primary objective. Wood volume produced would be a by-product of the treatment. These units are allocated to Late-Successional Reserve (LSR) by the NW Forest Plan.

Non-Commercial Density Management (NDNM): 25N-2b, 1-1b, 1-3e, 3-2, 3-3, 13-1b, 13-2x, 13-2z, 19N-3b, 19N-6, 7-1, 17-1b, 18-3, 19S-1a, 19S-1b

The objective of Non-Commercial Density Management treatments is the same as for CDM treatments, to reduce stand densities. No wood volume would be produced. These units are allocated to Late-Successional Reserve (LSR) by the NW Forest Plan.

Non-Commercial Density Management / Fuels (NDNM/Fuels): 29-1, 29-3, 30-1c

The objective of Non-Commercial Density Management / Fuels (NDNM/Fuels) treatments is the same as for CDM and NDNM treatments, to reduce stand densities. In these units accumulation of fuels is a concern. Treatments would be designed to reduce fuel loadings and ladder fuels in these units. Treatments would be designed to maintain adequate conifer regeneration as well as hardwoods so that Matrix and Riparian Reserve can be achieved in the future. No wood volume would be produced. These units are allocated to Matrix by the NW Forest Plan.

Regeneration Harvest Units (RH): 6-3

The objective of the regeneration harvest (RH) within unit 6-3 is to harvest timber and to replace an existing mature stand with a young vigorous conifer stand while retaining green conifers, a hardwood component, and providing for future coarse woody debris. Production is wood volume is a primary objective. Unit 6-3 is allocated to Matrix by the NW Forest Plan.

Overstory Removal Units (OR): 30-1a

The objective of the overstory removal harvest (OR) within unit 30-1b is to harvest timber and replace an existing mature stand with a young vigorous conifer stand with an emphasis on retaining existing conifer regeneration within the unit while retaining green conifers, a hardwood component, and providing for future coarse woody debris. Conifer regeneration would be released. Production is wood volume is a primary objective. Unit 30-1a is allocated to Matrix by the NW Forest Plan.

Commercial Thinning Units (CT): 30-1b

The objective of Commercial Thinning (CT) unit 30-1b is to reduce stand densities in areas occupied by conifers so that increased growth can occur on selected trees. Harvest of some wood volume at the present time and an increase/maintenance of growth rates for wood volume harvest in the future are primary objectives. Unit 30-1b is allocated to Matrix by the NW Forest Plan.

EFFECTS OF PROPOSED TREATMENTS

The following tables project short- and long- term effects of proposed treatments compared to no treatment. Projection of short-term effects has a higher degree of certainty compared to the projection of long-term effects. Stand condition and stand characteristics of stands treated at this time, 10-100 years into the future are highly dependant upon uncontrollable variables such as: climate stability or change, extreme weather, wildfire, future management direction, societal pressures, available funding for follow-up treatments, and random events.

Vegetation Effects – Short-term (0-10 years)

Stand Characteristic / Condition	No Treatment	Density Management / Commercial Thinning	RH/OR
Vigor	No change to decrease	No change to increase	No change to slight increase on retained trees
Growth Rate	No change to decrease	No change to increase	No change to slight increase on retained trees
Live Crown Ratio	No change to decrease	No change to increase	No change to slight increase on retained trees
Branching	Continued loss of lower limbs	Retention of lower limbs	Retention of lower limbs on retained trees
Ability to Respond to Release Treatments	No change to decrease	Increase, however due to low Live Crown Ratios (LCR), some retained trees probably won't respond much if at all in short-term	n/a
Stability	No change to decrease	No change to potential rapid decrease in areas where height /diameter ratios are currently high;	No change to decrease of

Stand Characteristic / Condition	No Treatment	Density Management / Commercial Thinning	RH/OR
		probable loss of some retained trees or groups of trees in some units	overstory trees
Coarse woody debris	No change to increase (small pieces)	Depending on fuels treatment, decrease or increase	No change to increase
Snags	No change to increase	Decrease	No change
Conifers species	No change to slight decrease	No change	No change
Hardwood species	Continued decrease	No change	Increase
Shrubs/Brush/forbs	Continued decrease	No change to slight decrease where shrubs are cut	Large increase
Development of late successional stand characteristics	Continued decrease	None to slight increase	Decrease
Canopy Gaps	No change to decrease	Slight increase. Potentially large increase if parts of stand collapse	n/a
Multiple Canopy Layers	No change to decrease	Slight increase. Potentially large increase if parts of stand collapse	n/a
Differentiation	Little to no additional	Little to no additional, possibly some decrease as smaller trees are thinned	n/a

Vegetation Effects –Long-term

Stand Characteristic / Condition	No Treatment	Density Management / Commercial Thinning	RH/OR
Vigor	Continued decrease. Vigor for some trees may increase as mortality in stand occurs	Increase	Dependant upon future stand management
Growth Rate	Decrease. Growth rates for some trees may increase as mortality in stand occurs	Increase	
Live Crown Ratio	Continued decrease	Increase	

Branching	Continued loss of lower limbs	Retention of lower limbs	
Ability to Respond to Release Treatments	Decrease to potential lost for the majority of the trees	Increase	
Stability	No change to continued decrease, possible stand collapse (or parts) in future	Increase	
Coarse woody debris	Increase – smaller pieces, short-term	Increase – larger pieces, longer lasting	
Snags	Increase – smaller snags, short-term	Increase – larger snags, longer lasting	
Conifer species	Principal species remains Douglas-fir. Minor species shift from pine to white fir and incense cedar. Larger amounts of hemlock on north aspects	Principal species remains Douglas-fir. Increase of white fir, incense cedar, and hemlock (northern aspects) as it seeds in.	
Hardwood species	Decrease	No change to decrease depending on growth	
Shrubs/Brush/forbs	Decrease	Slight decrease	
Development of late successional stand characteristics such as large branches and large hardwoods	Possibly never to gradual	Increase overall. Parts of these stands may never develop certain characteristics such as large branches	
Canopy Gaps	Gradual	No change to slight decrease as existing layers age and grow to increase	
Multiple Canopy Layers	Decrease	No change to slight decrease as existing layers age and grow	
Differentiation	No change to slight decrease as existing layers age and grow	No change to slight decrease as existing layers age and grow	

STAND DESCRIPTIONS / ANALYSES / RECOMMENDED TREATMENTS

UNIT 25N-1 T.31S., R.4W., section 25

Stand Description: Unit 25N-1 is a young stand that has resulted from two past timber harvests. The majority of Slim Jim 25N-1 is from the Sugar Creek sale. It is Sugar Creek #6 that was clearcut in 1967. The remainder of Unit 25N-1 is from the Sugar Meadows sale. It is Sugar Meadows #6 that was clearcut in 1979. Both harvest units were planted and both units have been precommercially thinned (approximately 80% of the unit was thinned at a 13'x13' spacing with the remainder at a 15'x15' spacing). Slim Jim 25N-1 is currently a Douglas-fir stand that is composed of small-size poles generally 6-10" dbh with an estimated average diameter of 8" dbh. Some similar diameter western hemlock and ponderosa pine is also present. The stand canopy has not yet closed entirely. Live crown ratios (LCR) of the dominant trees are generally 50-60%. Hardwood species present include madrone and big leaf maple. Shrub species include hazel/oceanspray, rhododendron, salal, huckleberry, and manzanita. Salal and bracken fern are present. Stocking is lower on southwest aspect.

Analysis: This area is designated Late Successional Reserve. Objectives for this land use allocation are focused on late successional habitat and the wildlife that it supports. Existing pole size conifers are capable of responding to a treatment that reduces competition from adjacent vegetation. While precommercial thinning has taken place within the unit, those treatments were designed primarily to produce wood volume. The current stand development trajectory will result in a loss of desired late successional stand characteristics such as: long crowns; large diameter branches; a mix of conifers, hardwoods, and shrubs; and canopy gaps.

Desired Future Condition/Results: The desired future condition resulting from this action would, in the short-term, be a stand that had 30-40% canopy cover retained across the unit. Reduction of the canopy to this level would result in reduced competition on retained trees. Growth rates of the remaining trees would increase where the stand is opened and would be maintained where the stand is currently more open. Mortality of remaining conifers and hardwoods would decrease. The stand would be two-storied. In the long-term, stand vigor would be maintained. Crowns of existing trees would become fuller and canopy cover would increase from post harvest levels. Eventually canopy cover would return to near pretreatment levels. However, instead consisting of numerous smaller trees, the canopy would be formed from the crowns of fewer but larger trees. Large hardwoods would be part of the stand.

Prevention/Avoidance Strategies: Enlarging growing space through a density management treatment while trees are capable of responding will allow more rapid growth to occur and will result in a quicker attainment of a forest stand with characteristics of older forests. Timely treatment will prevent growth from slowing and hardwoods from dying out of the stand by being overtopped. Timely treatment will also help to maintain stand stability by creating conditions where tree diameter growth rates are enough to support the weight of the tree.

Recommended Treatment: A **commercial density management (CDM)** treatment that thins from below is the recommended treatment for **unit 25N-1**. Mark to retain an average 30-40% canopy cover across the unit. Unlike prescriptions designed to increase or accelerate the growth of trees for wood volume, trees of a variety of conditions such as those containing decay, trees that have numerous and large branches, and trees with broken tops or past snow damage are to be retained in addition to trees that would be retained in a “traditional” commercial thin. Retain trees twenty inches and larger dbh. Where possible mark so that a variety of spacing of residuals will result. Mark so that small openings (canopy gaps) are created. This may involve marking two-three adjacent trees. In areas containing only non-commercial size conifers space conifers on an 18’x18’ spacing. Retain hardwoods. Thin and harvest cut stems to sixty (60) feet of streams. Cable yard with one end suspension. Thin the no harvest strips to twenty-five (25) feet of streams retaining some trees that would be felled as snags. Evaluate for need to treat fuels. Slash brush, handpile and burn piles as appropriate.

Silvicultural Options Considered: Retaining a higher level of canopy cover was considered but was not proposed as it was desirable to move the stand to one with characteristics of older forests as quickly as possible. Retaining a higher level of canopy would have also increased the possibility of additional entries being needed to develop a desired stand.

UNITS **25N-2a, 25N-2b**
 T.31S., R.4W., section 25

Stand Description: Units 25N-2a and 25N-2b are young stands that have resulted from a past timber harvest. These units were clearcut in 1969 under the McGinnis Creek sale. The unit was McGinnis Creek #4. The McGinnis Creek #4 unit was planted after harvest, was precommercially thinned on a 12'x12' spacing and was aerially fertilized. Slim Jim 25N-2a and 25N-2b are currently composed of small-size Douglas-fir poles, generally 6-10" dbh, with an estimated average diameter of 8" dbh. Some similar diameter western hemlock and ponderosa pine is also present. The stand canopy has not yet closed entirely. Live crown ratios (LCR) of the dominant trees are generally 50-60%. Hardwood species present include madrone and big leaf maple. Shrub species include hazel/oceanspray, rhododendron, salal, huckleberry, and manzanita. Salal and bracken fern are present. Stocking is lower on southwest aspect.

Analysis: This area is designated Late Successional Reserve. Objectives for this land use allocation are focused on late successional habitat and the wildlife that it supports. Existing pole size conifers are capable of responding to a treatment that reduces competition from adjacent vegetation. While precommercial thinning has taken place within the unit, those treatments were designed primarily to produce wood volume. The current stand development trajectory will result in a loss of desired late successional stand characteristics such as: long crowns; large diameter branches; a mix of conifers, hardwoods, and shrubs; and canopy gaps.

Desired Future Condition/Results: The desired future condition resulting from this action would, in the short-term, be a stand that had 30-40% canopy cover retained across the unit. Reduction of the canopy to this level would result in reduced competition on retained trees. Growth rates of the remaining trees would increase. Mortality of remaining conifers and hardwoods would decrease. The stand would be two-storied. In the long-term, stand vigor would be maintained. Crowns of existing trees would become fuller and canopy cover would increase from post harvest levels. Eventually canopy cover would return to near pretreatment levels. However, instead consisting of numerous smaller trees, the canopy would be formed from the crowns of fewer but larger trees. Large hardwoods would be part of the stand.

Prevention/Avoidance Strategies: Enlarging growing space through a density management treatment while trees are capable of responding will allow more rapid growth to occur and will result in a quicker attainment of a forest stand with characteristics of older forests. Timely treatment will prevent growth from slowing and hardwoods from dying out of the stand by being overtopped. Timely treatment will also help to maintain stand stability by creating conditions where tree diameter growth rates are enough to support the weight of the tree.

Recommended Treatment: A **commercial density management (CDM)** treatment that thins from below is the recommended treatment for unit 25N-2a. Mark to retain an average 30-40% canopy cover across the unit. Unlike prescriptions designed to increase or accelerate the growth of trees for wood volume, trees of a variety of conditions such as those containing decay, trees that have numerous and large branches, and trees with broken tops or past snow damage are to be retained in addition to trees that would be retained in a "traditional" commercial thin. Retain

trees twenty inches and larger dbh. Where possible mark so that a variety of spacing of residuals will result. Mark so that small openings (canopy gaps) are created. This may involve marking two-three adjacent trees. In areas containing only non-commercial size conifers space conifers on an 18'x18' spacing. Retain hardwoods. Thin and harvest cut stems to sixty (60) feet of streams. Tractor yard above the upper road. Cable yard with one end suspension below the upper road. Thin the no harvest strips to twenty-five (25) feet of streams retaining some trees that would be felled as snags. Evaluate for need to treat fuels. Handpile and burn piles as appropriate.

A **noncommercial density management (NDNM)** treatment that thins conifers less than 10" dbh on approximate 20'x20' spacing is the recommended treatment for **unit 25N-2b**. Fall excess conifer stems that are 7" dbh and less. Girdle excess conifer stems 7-10" dbh to obtain benefits of thinning and to provide small diameter snags. Retain hardwoods. Evaluate for need to treat fuels. Slash brush, handpile and burn piles as appropriate. Pile burning and thinning of 7-10" dbh stems may need to occur in two or more operations.

Silvicultural Options Considered: Retaining a higher level of canopy cover was considered but was not proposed as it was desirable to move the stand to one with characteristics of older forests as quickly as possible. Retaining a higher level of canopy would have also increased the possibility of additional entries being needed to develop a desired stand.

UNIT 25N-3
 T.31S., R.4W., section 25

Stand Description: Unit 25N-3 is a young stand unit that has resulted from past timber harvests (West Fork Sugar Creek #1, McGinnis Creek #4, Cleanup East I #7). Portions of the unit were clearcut in 1967, 1969, and 1979. The remainder of the unit was harvested in 1993. Understocked areas were planted and all but approximately four acres have been precommercially thinned at either a 13'x13' spacing or a 15'x15' spacing. The unit currently consists of Douglas-fir 6-14" dbh with an average tree size estimated to be about 8" dbh. The unit is somewhat patchy with the larger conifers being found in the southern and western portions of the unit. The understory is fairly open but does contain limited chinquapin, madrone, and salal. Some manzanita is present where the unit is open.

Analysis: This area is designated Late Successional Reserve. Objectives for this land use allocation are focused on late successional habitat and the wildlife that it supports. Existing pole size conifers are capable of responding to a treatment that reduces competition from adjacent vegetation. While precommercial thinning has taken place within the unit, those treatments were designed primarily to produce wood volume. The current stand development trajectory will result in a loss of desired late successional stand characteristics such as: long crowns; large diameter branches; a mix of conifers, hardwoods, and shrubs; and canopy gaps. Unthinned areas are overstocked.

Desired Future Condition/Results: The desired future condition resulting from this action would, in the short-term, be a stand that had 30-40% canopy cover retained across the unit. Reduction of the canopy to this level would result in reduced competition on retained trees. Growth rates of the remaining trees would increase. Mortality of remaining conifers and hardwoods would decrease. The stand would be two-storied. In the long-term, stand vigor would be maintained. Crowns of existing trees would become fuller and canopy cover would increase from post harvest levels. Eventually canopy cover would return to near pretreatment levels. However, instead consisting of numerous smaller trees, the canopy would be formed from the crowns of fewer but larger trees. As seeding in from surrounding stands occurred, the unit would develop into a three storied stand. Large hardwoods would be part of the middle layer.

Prevention/Avoidance Strategies: Enlarging growing space through a density management treatment while trees are capable of responding will allow more rapid growth to occur and will result in a quicker attainment of a forest stand with characteristics of older forests. Timely treatment will prevent growth from slowing and hardwoods from dying out of the stand by being overtopped. Timely treatment will also help to maintain stand stability by creating conditions where tree diameter growth rates are enough to support the weight of the tree.

Recommended Treatment: A commercial density management (CDM) treatment that thins from below is the recommended treatment for unit 25N-3. Mark to retain an average 30-40% canopy cover across the unit. Unlike prescriptions designed to increase or accelerate the growth of trees for wood volume, trees of a variety of conditions such as those containing decay, trees

that have numerous and large branches, and trees with broken tops or past snow damage are to be retained in addition to trees that would be retained in a “traditional” commercial thin. Retain trees twenty inches and larger dbh. Where possible mark so that a variety of spacing of residuals will result. Mark so that small openings (canopy gaps) are created. This may involve marking two-three adjacent trees. In areas containing only non-commercial size conifers space conifers on a 16’x16’ spacing. Retain hardwoods. Thin and harvest cut stems to sixty (60) feet of streams. Cable yard with one end suspension. Thin the no harvest strips to twenty-five (25) feet of streams retaining some trees that would be felled as snags. Evaluate for need to treat fuels. Slash brush, handpile and burn piles as appropriate.

Silvicultural Options Considered: Retaining a higher level of canopy cover considered but was not proposed as it was desirable to move the stand to one with characteristics of older forests as quickly as possible. Retaining a higher level of canopy would have also increased the possibility of additional entries being needed to develop a desired stand.

UNIT 25N-4
T.31S., R.4W., section 25

Stand Description: Unit 25N-4 is a small strip of younger conifers that developed within the right-of-way of a road 31-3-31. Douglas-fir is the primary species present. Incense cedar and madrone are present. Aside from the initial timber harvest that occurred with the building of the road, no treatment other than roadside brushing has occurred in this unit

Analysis: This area is designated Late Successional Reserve. Objectives for this land use allocation are focused on late successional habitat and the wildlife that it supports. Existing conifers are capable of responding to a treatment that reduces competition from adjacent vegetation. The unit is overstocked. Growth will slow with current stocking levels. The unit parallels a road and has a stand of older trees downslope of it. In addition to promoting characteristics of older forest stands, it is desired to “blend” unit with the adjacent stand to decrease sharp transitions from old stand to road right-of-way to road.

Desired Future Condition/Results: The desired future condition resulting from this action would, in the short-term, be a stand that had 50% canopy cover retained. Reduction of the canopy to this level would result in reduced competition on retained trees. Growth rates of the remaining trees would increase. Mortality of remaining conifers and hardwoods would decrease. In the long-term, stand vigor would be maintained. Crowns of existing trees would become fuller and canopy cover would increase from post harvest levels. Eventually canopy cover would return to near pretreatment levels. However, instead consisting of numerous smaller trees, the canopy would be formed from the crowns of fewer but larger trees. Collapse of roadside trees would decrease as height / diameters ratios of remaining trees would be such that trees were thick enough to provide support for the entire bole.

Prevention/Avoidance Strategies: Maintenance of canopy along road would slow/prevent the establishment and growth of competitive vegetation such as ceanothus as well as the seeding in of additional conifers.

Recommended Treatment: A **commercial density management (CDM)** treatment that thins from below is the recommended treatment for unit 25N-4. Mark to retain 50% canopy cover across the unit. Retain trees twenty inches and larger dbh. In areas containing only non-commercial size conifers space conifers on a 14'x14' spacing. Retain hardwoods. Tractor/shovel yard from road. Evaluate for need to treat fuels. Slash brush, handpile and burn piles as appropriate.

Silvicultural Options Considered: None.

UNIT 27-1
T.31S., R.4W., section 27

Stand Description: Unit 27-1 is a young stand unit that has resulted from past timber harvest. The unit (McGinnis Creek #1) was clearcut in 1964. The unit received site preparation, planting and release treatments following harvest. The unit was precommercially thinned in 1977 at a 12' x 12' spacing and was aerially fertilized in 1978. The unit currently consists of Douglas-fir trees 6-18" dbh with an average tree size estimated to be about 12-14" dbh. Smaller conifers dominate above the road. The unit is somewhat patchy with larger conifers being found in the southern portion of the unit. Conifer live crown ratios are generally 15-40% with some being greater. Conifer growth is slowing. The understory is fairly open but does contain limited madrone, rhododendron, chinquapin, ocean spray, and salal. Some manzanita is present where the unit is open.

Analysis: This area is designated Late Successional Reserve. Objectives for this land use allocation are focused on late successional habitat and the wildlife that it supports. The unit is in the Galesville Reservoir Special Recreational Management Area (SRMA) and is near the reservoir. The unit is adjacent to the main county road accessing Galesville Reservoir and visuals are a concern. The unit is near Chief Miwaleta recreation site. Growth is slowing on existing pole size conifers. Conifers that would remain after a treatment that reduces competition are capable of responding. While precommercial thinning has taken place within the unit, those treatments were designed primarily to produce wood volume. The current stand development trajectory will result in a loss of desired late successional stand characteristics such as: long crowns; large diameter branches; a mix of conifers, hardwoods, and shrubs; and canopy gaps. Unit 27-1 contains a buried fiber-optic cable along the road.

Desired Future Condition/Results: The desired future condition resulting from this action would, in the short-term, be a stand that had 30-40% canopy cover retained over most of the unit. Reduction of the canopy to this level would result in reduced competition on retained trees. Growth rates of the remaining trees would increase. Mortality of remaining conifers and hardwoods would decrease. The stand would be two-storied. In the long-term, stand vigor would be maintained. Crowns of existing trees would become fuller and canopy cover would increase from post harvest levels. Eventually canopy cover would return to near pretreatment levels. However, instead consisting of numerous smaller trees, the canopy would be formed from the crowns of fewer but larger trees. Large hardwoods would be part of the stand.

Prevention/Avoidance Strategies: Enlarging growing space through a density management treatment while trees are capable of responding will allow more rapid growth to occur and will result in a quicker attainment of a forest stand with characteristics of older forests. Timely treatment will prevent growth from slowing and hardwoods from dying out of the stand by being overtopped. Timely treatment will also help to maintain stand stability by creating conditions where tree diameter growth rates are enough to support the weight of the tree.

Recommended Treatment: A commercial density management (CDM) treatment that thins from below is the recommended treatment for unit 27-1. Lightly thin a 100' strip along the road,

retaining 70-80% canopy immediately adjacent to the paved county road (primarily removing only selected non-commercial conifers and brush) and gradually removing increasing numbers of trees in the strip as distance from the road increases. Non-commercial density management treatment is recommended for the area above road 31-4-27. Space trees on a variable spacing (crown space) so that there are 4-8 feet between crowns of residual trees. Maintain a no treatment area from road 31-4-27 east through the creek to a point twenty-five feet east of the top of the draw to help maintain stream bank stability. In the remainder of the unit, designate two ¼ acre areas to remain unthinned and mark the remaining area to retain an average 30-40% canopy cover. Unlike prescriptions designed to increase or accelerate the growth of trees for wood volume, trees of a variety of conditions such as those containing decay, trees that have numerous and large branches, and trees with broken tops or past snow damage are to be retained in addition to trees that would be retained in a “traditional” commercial thin. Retain trees twenty inches and larger dbh. Where possible mark so that a variety of spacing of residuals will result. Mark so that small openings (canopy gaps) are created. This may involve marking two-three adjacent trees. Tractor yard. In areas containing predominantly non-commercial size conifers space conifers on a 16'x16' spacing. Retain hardwoods across unit. Evaluate for need to treat fuels. Slash brush, handpile and burn piles as appropriate. The average retention of canopy closure for the unit is 40-60%.

Silvicultural Options Considered: Reduction of stand densities across the entire unit was considered but was rejected due to visual (recreational) concerns and variability within the unit.

UNIT **28-1**
 T.31S., R.4W., section 28

Stand Description: Unit 28-1 is a young stand that has resulted from past timber harvest. The unit (Upper Cow Creek) was clearcut in 1959. The unit received site preparation, planting and maintenance treatments following harvest. No other treatments have been done. The unit can be roughly divided into northwest and southeast portions. The northwest portion consists of older natural small pole and post size Douglas-fir generally 4-8" dbh with an average diameter of less than six inches dbh. Understory is open with salal and bracken fern in openings. The southeast portion of the unit consists of Douglas-fir 2-5" dbh mixed with oceanspray, rhododendron, vine maple, madrone, salal, and bracken fern.

Analysis: This area is designated Late Successional Reserve. Objectives for this land use allocation are focused on late successional habitat and the wildlife that it supports. The unit is in the Galesville Reservoir Special Recreational Management Area (SRMA) and is adjacent to the reservoir. Visuals are a concern. The unit is near the dam and is directly across from a viewing area. Growth is slowing on existing conifers. Conifers that would remain after a treatment that reduces competition are capable of responding. The current stand development trajectory will result in a loss of desired late successional stand characteristics such as: long crowns; large diameter branches; a mix of conifers, hardwoods, and shrubs; and canopy gaps. Current size classes of conifers within the unit fall between what is generally considered commercial (> 8" dbh) and what traditional has been precommercially thinned. While as a whole the unit is non-commercial there may be some conifer stems that would be.

Desired Future Condition/Results: The desired future condition resulting from this action would, in the short-term, be a thinned stand whose visual appearance when viewed from the other side of the reservoir and from the water changed very little after treatment. It would be a stand where suppressed and intermediate as well as limited numbers of co-dominant conifers would be removed to increase available growing space, nutrients, water, and light for residual conifers. Reduced competition on retained trees would result in maintained or increased growth rates. Mortality of remaining conifers and hardwoods would decrease. In the long-term, stand vigor would be maintained. Crowns of existing trees would become fuller and canopy cover would increase from post harvest levels. Eventually canopy cover would return to near pretreatment levels. However, instead consisting of numerous smaller trees, the canopy would be formed from the crowns of fewer but larger trees. Large hardwoods would be part of the stand.

Prevention/Avoidance Strategies: Retention of canopy cover for visuals will prevent/decrease the seeding in of conifers from surrounding stands and the possibility the need for additional follow-up non-commercial treatments.

Recommended Treatment: A commercial density management / smallwood (CDM/SW) treatment that thins from below is the recommended treatment for unit 28-1. To retain visual qualities of Galesville Reservoir it is recommended that the unit be treated as three different areas, each with a slightly different treatment. The area extending downslope from road 31-4-34

one hundred feet should be lightly thinned in a manner that maintains a visual screen for the road and the road cutbank. Space trees on a variable spacing (crown space) so that there is approximately 3 feet between crowns of residual trees. Similarly, it is recommended that a light thinning be done in the portion of the unit from the reservoir high water mark upslope one hundred feet. Thin lower strip so there is a small (10-15') unthinned strip adjacent to the reservoir. Space trees on a variable spacing (crown space) so that there is generally 3 feet between crowns of residual trees. The average canopy closure retention for those two portions would be 60%. In the remaining part of the unit variably space (crown space) trees so that there is 4-8 feet between crowns of residual trees. The average canopy closure retention would be 50%. Unlike prescriptions designed to increase or accelerate the growth of trees for wood volume, trees of a variety of conditions such as those containing decay, trees that have numerous and large branches, and trees with broken tops or past snow damage are to be retained in addition to trees that would be retained in a "traditional" commercial thin. Retain trees larger than 8" dbh. Retain hardwoods. Where it can be done without unacceptable damage to resources, remove boles of cut trees by cable or other system such as a monocable or chutes system that is designed to remove small logs with minimal disturbance. Evaluate for need to treat fuels. Slash brush, handpile and burn piles as appropriate. Seed cable corridors and burned areas with a mixture of native forage plants if seed is available. The average retention

Silvicultural Options Considered: A treatment that produced a wider spacing of residual trees was considered but was rejected as visual qualities may not have been maintained.

UNIT **34-1**
T.31S., R.4W., section 34

Stand Description: Unit 34-1 is a young stand that has resulted from past timber harvests. It is the combination of two units. The majority of the unit is the old Galesville Return #2 unit that was shelterwooded in 1978, clearcut in 1983, planted, and precommercially thinned on a 14'x14' spacing. The remainder of unit 34-1 is the Whitehorse #2 unit that received an overstory removal harvest in 1991 and a maintenance treatment to establish conifer regeneration already on the site. The unit consists of Douglas-fir generally 4-8" dbh with an average diameter of less than six inches dbh. Understory is open with salal and bracken fern mixed with oceanspray, rhododendron, vine maple, madrone, and salal.

Analysis: This area is designated Late Successional Reserve. Objectives for this land use allocation are focused on late successional habitat and the wildlife that it supports. The unit is in the Galesville Reservoir Special Recreational Management Area (SRMA) and is visible from the reservoir. Visuals are a concern. Conifers that would remain after a treatment that reduces competition are capable of responding. The current stand development trajectory will result in a loss of desired late successional stand characteristics such as: long crowns; large diameter branches; a mix of conifers, hardwoods, and shrubs; and canopy gaps. Current size classes of conifers within the unit fall between what is generally considered commercial (> 8" dbh) and what traditionally has been precommercially thinned. While as a whole the unit is non-commercial, there may be some conifer stems that would be. Unit contains some stream areas that have slipped-out.

Desired Future Condition/Results: The desired future condition resulting from this action would, in the short-term, be a thinned stand whose visual appearance when viewed from the other side of the reservoir and from the water changed very little after treatment. It would be a stand where suppressed and intermediate as well as limited numbers of co-dominant conifers would be removed to increase available growing space, nutrients, water, and light for residual conifers. Reduced competition on retained trees would result in maintained or increased growth rates. Mortality of remaining conifers and hardwoods would decrease. In the long-term, stand vigor would be maintained. Crowns of existing trees would become fuller and canopy cover would increase from post harvest levels. Eventually canopy cover would return to near pretreatment levels. However, instead consisting of numerous smaller trees, the canopy would be formed from the crowns of fewer but larger trees. Large hardwoods would be part of the stand.

Prevention/Avoidance Strategies: Retention of canopy cover for visuals will prevent/decrease the seeding in of conifers from surrounding stands and the possibility the need for additional follow-up non-commercial treatments.

Recommended Treatment: A commercial density management / smallwood (CDM/SW) treatment that thins from below is the recommended treatment for unit 34-1. To retain visual qualities of Galesville Reservoir it is recommended that the unit be treated as two different areas, each with a slightly different treatment. The area extending downslope from the upper unit

boundary one hundred feet should be lightly thinned in a manner that maintains a visual screen for the ridge and roadwork on it. Space trees on a variable spacing (crown space) so that there is approximately 3 feet between crowns of residual trees. In the remaining part of the unit variably space (crown space) trees so that there is 3-6 feet between crowns of residual trees. Unlike prescriptions designed to increase or accelerate the growth of trees for wood volume, trees of a variety of conditions such as those containing decay, trees that have numerous and large branches, and trees with broken tops or past snow damage are to be retained in addition to trees that would be retained in a “traditional” commercial thin. Retain trees larger than 8” dbh. Retain hardwoods. Thin to twenty-five (25) feet of streams. In areas where stream banks have slid-out, maintain a forty (40) foot no treatment strip from edge of slip. Where it can be done without unacceptable damage to resources, remove boles of cut trees by cable or other system such as chutes designed to remove small logs from a unit. Design yarding so that corridors will not be visible from across the reservoir or from the water. Evaluate for need to treat fuels. Slash brush, handpile and burn piles as appropriate. Seed cable corridors and burned areas with a mixture of native forage plants if seed is available. The average canopy closure retention for this unit would be 50%.

Silvicultural Options Considered: A treatment that produced a wider spacing of residual trees was considered but was rejected as visual qualities would not be maintained.

UNITS 1-1a, 1-1b
T.32S., R.4W., section 1

Stand Description: Units 1-1a and 1-1b are young stands that have resulted from past timber harvests. The majority of the combined area was clearcut in 1963 as the Houck Ranch #3 unit. It received site preparation, planting and maintenance treatments after harvest. The remainder of the combined area was clearcut in 1968 as Anchor Ranch #2. It was planted after harvest. Both units have been precommercially thinned at a 12'x12' spacing and both units were aerially fertilized to accelerate growth. Both units are currently composed primarily of Douglas-fir. Average conifer diameter within unit 1-1a is estimated to be 14". Diameters are smaller in unit 1-1b.

Analysis: This area is designated Late Successional Reserve. Objectives for this land use allocation are focused on late successional habitat and the wildlife that it supports. Existing pole size conifers are capable of responding to a treatment that reduces competition from adjacent vegetation. While precommercial thinning has taken place within the unit, those treatments were designed primarily to produce wood volume. The current stand development trajectory will result in a loss of desired late successional stand characteristics such as: long crowns; large diameter branches; a mix of conifers, hardwoods, and shrubs; and canopy gaps. Unit 1-1b contains smaller diameter conifers capable of responding to release. Soils are potentially erosive.

Desired Future Condition/Results: The desired future condition resulting from this action would, in the short-term, be a stand that had 40% canopy cover retained across the unit. Reduction of the canopy to this level would result in reduced competition on retained trees. Growth rates of the remaining trees would increase. Mortality of remaining conifers and hardwoods would decrease. The stand would be two-storied. In the long-term, stand vigor would be maintained. Crowns of existing trees would become fuller and canopy cover would increase from post harvest levels. Eventually canopy cover would return to near pretreatment levels. However, instead consisting of numerous smaller trees, the canopy would be formed from the crowns of fewer but larger trees. Large hardwoods would be part of the stand.

Prevention/Avoidance Strategies: Enlarging growing space through a density management treatment while trees are capable of responding will allow more rapid growth to occur and will result in a quicker attainment of a forest stand with characteristics of older forests. Timely treatment will prevent growth from slowing and hardwoods from dying out of the stand by being overtopped. Timely treatment will also help to maintain stand stability by creating conditions where tree diameter growth rates are enough to support the weight of the tree.

Recommended Treatment: A commercial density management (CDM) treatment that thins from below is the recommended treatment for **unit 1-1a**. Mark to retain an average 40% canopy cover across the unit. Unlike prescriptions designed to increase or accelerate the growth of trees for wood volume, trees of a variety of conditions such as those containing decay, trees that have numerous and large branches, and trees with broken tops or past snow damage are to be retained in addition to trees that would be retained in a "traditional" commercial thin. Retain trees twenty

inches and larger dbh. Where possible mark so that a variety of spacing of residuals will result. Mark so that small openings (canopy gaps) are created. This may involve marking two-three adjacent trees. In areas containing only non-commercial size conifers space conifers on a 16'x16' spacing. Retain hardwoods. Thin and harvest cut stems to ninety (90) feet of streams. Cable (cable swing) yard with one end suspension. Create three quarter acre openings within unit 1-1a where all but 2-4 conifers are removed. Conifers retained in the openings should be those that are most likely to remain standing after wind and/or snow events. Situate openings where they are unlikely to be visible from Upper Cow Creek Road. This may mean openings that are not circular in shape. Situate openings on stable slopes and a minimum of 180 feet from draws. A **noncommercial density management treatment (NDNM)** that thins from below is recommended for non-harvest areas within unit 1-1a, areas that do not contain commercial size trees, and **unit 1-1b**. Thin no harvest strips to twenty-five (25) feet of streams retaining. Thin excess conifers less than 10"dbh on approximate 20'x20' spacing. Fall excess conifer stems that are 7" dbh and less. Girdle excess conifer stems 7-10"dbh to obtain benefits of thinning and to provide small diameter snags. Retain hardwoods. Evaluate for need to treat fuels. Slash brush, handpile and burn piles as appropriate. Pile burning and thinning of 7-10" dbh stems may need to occur in two or more operations.

Silvicultural Options Considered: Retaining a higher level of canopy cover was considered but was not proposed as it was desirable to move the stand to one with characteristics of older forests as quickly as possible. Retaining a higher level of canopy would have also increased the possibility of additional entries being needed to develop a desired stand.

UNITS 1-3a, 1-3b, 1-3c, 1-3d, 1-3e
T.32S., R.4W., section 1

Stand Description: Units 1-3a, 1-3b, 1-3c, 1-3d, and 1-3e are subunits of Unit 1-3. Unit 1-3 is similar to other younger stands included the project. Most of the unit is a plantation that has resulted from past timber harvests. The portion below the road (Houck Ranch #1) was clearcut in 1963. It was planted after harvest and a maintenance treatment was done to aid seedling establishment. The unit was pre-commercially thinned at a 12'x12' spacing and was aerially fertilized. Although thinning has occurred some variability in spacing exists. This portion of the unit is currently composed of Douglas-fir poles that are 8-16" dbh. Average diameter is approximately ten inches. Hemlock and white fir are present within this portion of the unit as are big leaf maple, vine maple, salal, and sword fern. The portion of the unit above the road (Anchor Ranch #1) and in the draw was clearcut in 1968 and was planted after harvest. It too was precommercially thinned at a 12'x12' spacing and aerially fertilized. The eastern part (NW aspect) is minimally stocked with Douglas-fir 4-12" dbh mixed with ocean spray, canyon live oak, poison oak, madrone, rhododendron, chinquapin, and manzanita. The western portion (NE aspect) consists of small Douglas-fir poles. Diameters are variable but generally range from 4-14" dbh with some stems being larger. Some areas contain commercial size trees and other areas do not. A third area within unit 1-3 is the portion above the road in the extreme west. This area is a stand of Douglas-fir poles mixed with hemlock and white fir. Diameters are generally 8-16" dbh with the average being ten inches in diameter. Vine maple, big leaf maple, salal, and sword fern are present. This portion of the unit contains areas where old skid roads have combined with natural drainage features.

Analysis: This area is designated Late Successional Reserve. Objectives for this land use allocation are focused on late successional habitat and the wildlife that it supports. Existing pole size conifers are capable of responding to a treatment that reduces competition from adjacent vegetation. While precommercial thinning has taken place within much of the unit, those treatments were designed primarily to produce wood volume. The current stand development trajectory will result in a loss of desired late successional stand characteristics such as: long crowns; large diameter branches; a mix of conifers, hardwoods, and shrubs; and canopy gaps. Unit 1-3 contains areas of smaller diameter conifers. Unit is situated along a creek. Streambank stability and sedimentation is a concern. Soils are potentially erosive.

Desired Future Condition/Results: The desired future condition resulting from this action would, in the short-term, be a stand that had reduced numbers of conifer stems that would result in reduced competition on retained trees. Growth rates of the remaining trees would increase. Mortality of remaining conifers and hardwoods would decrease. The stand would be two-storied. In the long-term, stand vigor would be maintained. Crowns of existing trees would become fuller and canopy cover would increase from post harvest levels. Eventually canopy cover would return to near pretreatment levels. However, instead consisting of numerous smaller trees, the canopy would be formed from the crowns of fewer but larger trees. Large hardwoods would be part of the stand.

Prevention/Avoidance Strategies: Enlarging growing space through a density management treatment while trees are capable of responding will allow more rapid growth to occur and will result in a quicker attainment of a forest stand with characteristics of older forests. Timely treatment will prevent growth from slowing and hardwoods from dying out of the stand by being overtopped. Timely treatment will also help to maintain stand stability by creating conditions where tree diameter growth rates are enough to support the weight of the tree.

Recommended Treatment: A commercial density management (CDM) treatment that thins from below is the recommended treatment for **units 1-3a, 1-3b, 1-3c, and 1-3d.** Mark to retain 40-50% canopy cover across each sub-unit. This level of canopy cover will allow for some release of retained trees while providing additional protection for nearby streams. Unlike prescriptions designed to increase or accelerate the growth of trees for wood volume, trees of a variety of conditions such as those containing decay, trees that have numerous and large branches, and trees with broken tops or past snow damage are to be retained in addition to trees that would be retained in a “traditional” commercial thin. Retain trees twenty inches and larger dbh. Where possible mark so that a variety of spacing of residuals will result. Mark so that small openings (canopy gaps) are created. This may involve marking two-three adjacent trees. Retain hardwoods. Downhill cable yard sub-units 1-3a and 1-3b. Cable yard with one end suspension sub-unit 1-3c. And cable/shovel yard sub-unit 1-3d. In areas containing non-commercial size conifers, space conifers on a 16’x16’ spacing. Thin the no harvest strips to twenty-five (25) feet of streams retaining some trees that would be felled as snags. A **noncommercial density management treatment (NDNM)** that thins from below is recommended for **unit 1-3e.** Thin non-commercial trees at a 16’x16’ to 18’x18’ spacing. Retain hardwoods. Where stem diameters are merchantable within unit 1-3e, where little or no noncommercial density management thinning would occur create snags at the rate of two per acre by girdling codominant Douglas-fir. Retain hardwoods. Evaluate for need to treat fuels. Slash brush, handpile and burn piles as appropriate.

Silvicultural Options Considered: Conducting a commercial density management treatment throughout unit 1-3 but was proposed but was rejected because of streambank stability and sedimentation concerns. A treatment that retained less canopy cover was proposed but was rejected because of streambank stability and sedimentation concerns. Cable yarding of subunit 1-3d is proposed under Alternative 3.

UNIT 1-4
T.32S., R.4W., section 1

Stand Description: Unit 1-4 is an unentered single-storied stand of Douglas-fir poles. Stem diameters range from 2-20" dbh. Average diameter in the upper portion of the unit between the roads is estimated to be 10". In the remainder of the unit (to the west) the average diameter is estimated to be 10-14" depending on the location. Limited madrone 6-12" in diameter is present. Much of it is dying out from shading. The understory is relatively open. Some canyon live oak is present.

Analysis: This area is designated Late Successional Reserve. Objectives for this land use allocation are focused on late successional habitat and the wildlife that it supports. Unit is an older stand that is currently listed as CHU (Critical Habitat Unit). Existing pole size conifers are capable of responding to a treatment that reduces competition from adjacent vegetation. Hardwoods are dying out of the stand. The current stand development trajectory will result in a loss of desired late successional stand characteristics such as: long crowns; large diameter branches; a mix of conifers, hardwoods, and shrubs; and canopy gaps. Soils are potentially erosive.

Desired Future Condition/Results: The desired future condition resulting from this action would be a unit that had two very distinct canopy layers. The upper canopy layer would consist of primarily Douglas fir. Large hardwoods would be retained within the unit. The understory would consist of hardwoods, shrubs and Douglas-fir regeneration that became established within canopy gaps created by the thinning.

Prevention/Avoidance Strategies: Treatment that reduced stand density and canopy cover would help to keep larger hardwoods alive within the stand.

Recommended Treatment: A **commercial density management (CDM)** treatment that thins from below is the recommended treatment for unit 1-4. Mark to retain an average 60% canopy cover across the unit. Unlike prescriptions designed to increase or accelerate the growth of trees for wood volume, trees of a variety of conditions such as those containing decay, trees that have numerous and large branches, and trees with broken tops or past snow damage are to be retained in addition to trees that would be retained in a "traditional" commercial thin. Retain trees twenty inches and larger dbh. Where possible mark so that a variety of spacing of residuals will result. Mark so that small openings (canopy gaps) are created. This may involve marking two-three adjacent trees. Cable yard with one end suspension. Thin the no harvest strips to twenty-five (25) feet of streams retaining some trees that would be felled as snags. Evaluate for need to treat fuels. Slash brush, handpile and burn piles as appropriate.

Silvicultural Options Considered: NA treatment that retain less canopy cover was considered but was rejected because of wildlife habitat concerns.

UNIT 3-1a, 3-1b
T.32S., R.4W., section 3

Stand Description: Units 3-1a and 3-1b are young stands that have resulted from past timber harvest (Whitehorse #3). The combined unit was clearcut in 1965 and was planted. The combined unit was precommercially thinned at a 13'x13' spacing. The southern part of the unit currently consists of Douglas-fir 6-10" dbh. Spacing is wide enough so that some conifers have a live crown ratio of 50-60%. Conifer diameters are slightly larger (8-14" dbh) in the northern part of the unit. Average diameter is estimated to be about 8" dbh. The understory contains limited chinquapin, ocean spray, salal, sword and bracken fern and big leaf maple.

Analysis: This area is designated Late Successional Reserve. Objectives for this land use allocation are focused on late successional habitat and the wildlife that it supports. These units are within the Galesville Reservoir SRMA but because of how unit is situated, visuals are not a concern. Existing conifers are capable of responding to a treatment that reduces competition from adjacent vegetation. While precommercial thinning has taken place within the unit, those treatments were designed primarily to produce wood volume. The current stand development trajectory will result in a loss of desired late successional stand characteristics such as: long crowns; large diameter branches; a mix of conifers, hardwoods, and shrubs; and canopy gaps.

Desired Future Condition/Results: The desired future condition resulting from this action would, in the short-term, be a stand that had 30-40% canopy cover retained across the unit. Reduction of the canopy to this level would result in reduced competition on retained trees. Growth rates of the remaining trees would increase. Mortality of remaining conifers and hardwoods would decrease. The stand would be two-storied. In the long-term, stand vigor would be maintained. Crowns of existing trees would become fuller and canopy cover would increase from post harvest levels. Eventually canopy cover would return to near pretreatment levels. However, instead consisting of numerous smaller trees, the canopy would be formed from the crowns of fewer but larger trees. Large hardwoods would be part of the stand.

Prevention/Avoidance Strategies: Enlarging growing space through a density management treatment while trees are capable of responding will allow more rapid growth to occur and will result in a quicker attainment of a forest stand with characteristics of older forests. Timely treatment will prevent growth from slowing and hardwoods from dying out of the stand by being overtopped. Timely treatment will also help to maintain stand stability by creating conditions where tree diameter growth rates are enough to support the weight of the tree.

Recommended Treatment: A **commercial density management (CDM)** treatment that thins from below is the recommended treatment for **unit 3-1a**. Mark to retain an average 30-40% canopy cover across the unit. Unlike prescriptions designed to increase or accelerate the growth of trees for wood volume, trees of a variety of conditions such as those containing decay, trees that have numerous and large branches, and trees with broken tops or past snow damage are to be retained in addition to trees that would be retained in a "traditional" commercial thin. Retain trees twenty inches and larger dbh. Where possible mark so that a variety of spacing of residuals will result. Mark so that small openings (canopy gaps) are created. This may involve marking

two-three adjacent trees. In areas containing only non-commercial size conifers space conifers spacing. Retain hardwoods. Thin and harvest cut stems to sixty (60) feet of streams. Cable yard with one end suspension. Create two, quarter acre openings within unit 3-1 where all but 2-4 conifers are removed. Conifers retained in the openings should be those that are most likely to remain standing after wind and/or snow events. Situate openings on stable slopes and a minimum of 180 feet from draws. Thin the no harvest areas and areas of non-commercial conifers to twenty-five (25) feet of streams on a 16'x16' spacing retaining some trees that would be felled as snags. Evaluate for need to treat fuels. Slash brush, handpile and burn piles as appropriate. In the remaining 5 acres of unit 3-1 **a noncommercial density management (NDNM)** treatment that spaces conifers on a 16'x16' spacing is recommended for unit **3-1b**. Retain hardwoods. Evaluate for need to treat fuels. Slash brush, handpile and burn piles as appropriate.

Silvicultural Options Considered: Retaining a higher level of canopy cover was considered but was not proposed as it was desirable to move the stand to one with characteristics of older forests as quickly as possible. Retaining a higher level of canopy would have also increased the possibility of additional entries being needed to develop a desired stand.

UNIT 3-2
T.32S., R.4W., section 3

Stand Description: Unit 3-2 is a young stand that has resulted from past timber harvests. A small portion of the unit received a selection cut in 1975 where some of the overstory was removed. In 1981 the majority of the unit was clearcut. After harvest the unit received a site preparation treatment and was planted where natural regeneration did not exist. Some of the unit was precommercially thinned to a 14'x14' spacing in 1994. The unit is currently composed of Douglas-fir 4-8" dbh over rhododendron, salal, and bracken fern. Big leaf maple, alder, madrone, and chinquapin are present. The canopy has not closed.

Analysis: This area is designated Late Successional Reserve. Objectives for this land use allocation are focused on late successional habitat and the wildlife that it supports. Unit 3-2 is within the Galesville Reservoir SRMA but because of how unit is situated, visuals are not a concern. Existing conifers are capable of responding to a treatment that reduces competition from adjacent vegetation. While precommercial thinning has taken place within the unit, those treatments were designed primarily to produce wood volume. The current stand development trajectory will result in a loss of desired late successional stand characteristics such as: long crowns; large diameter branches; a mix of conifers, hardwoods, and shrubs; and canopy gaps.

Desired Future Condition/Results: The desired future condition resulting from this action would be a stand that had stand densities reduced. Reduction of densities would result in reduced competition on retained trees. Growth rates of the remaining trees would be maintained or would increase. Mortality of remaining conifers and hardwoods would decrease. There would be a hardwood component within the stand for a longer period of time. In the long-term, stand vigor would be maintained. Crowns of existing trees would become fuller and canopy cover would increase from post harvest levels. Eventually canopy cover would close. However, instead consisting of numerous smaller trees, the canopy would be formed from the crowns of fewer but larger trees. Large hardwoods would be part of the stand.

Prevention/Avoidance Strategies: Enlarging growing space through a density management treatment while trees are capable of responding will allow more rapid growth to occur and will result in a quicker attainment of a forest stand with characteristics of older forests. Timely treatment will prevent growth from slowing and hardwoods from dying out of the stand by being overtopped. Timely treatment will also help to maintain stand stability by creating conditions where tree diameter growth rates are enough to support the weight of the tree.

Recommended Treatment: A **non-commercial density management treatment** is recommended for **unit 3-2**. Space conifers seven inches and less on a variable spacing (crown space) so that there is 4-8 feet between crowns of residual trees. Retain hardwoods. On stump sprouted hardwoods treat so as to retain only one or two main stems. Create two, quarter acre openings within unit 3-1 where all but 2-4 conifers are removed. Conifers retained in the openings should be those that are most likely to remain standing after wind and/or snow events. Situate openings on stable slopes and a minimum of 180 feet from draws. Evaluate for need to treat fuels. Slash brush, handpile and burn piles as appropriate.

Silvicultural Options Considered: A treatment that did not include creation of ¼ acre openings was considered but was rejected as desired stand diversity would not be created.

UNIT 3-3
T.32S., R.4W., section 3

Stand Description: Unit 3-3 is a small strip of younger conifers that developed within the right-of-way of a road 32-4-9. Douglas-fir is the primary species present. Big leaf maple is present. Aside from the initial timber harvest that occurred with the building of the road, no treatment other than roadside brushing has occurred in this unit

Analysis: This area is designated Late Successional Reserve. Objectives for this land use allocation are focused on late successional habitat and the wildlife that it supports. Unit 3-3 is within the Galesville Reservoir SRMA but because of how unit is situated, visuals are not a concern. Existing conifers are capable of responding to a treatment that reduces competition from adjacent vegetation. The unit is overstocked. Growth will slow with current stocking levels. The unit parallels a road and has a stand of older trees downslope of it. In addition to promoting characteristics of older forest stands, it is desired to “blend” unit with the adjacent stand to decrease sharp transitions from old stand to road right-of-way to road.

Desired Future Condition/Results: The desired future condition resulting from this action would, in the short-term, be a stand that had stocking levels reduced but still retained a fairly high level of canopy cover. Reduction of the canopy would result in reduced competition on retained trees. Growth rates of the remaining trees would increase. Mortality of remaining conifers and hardwoods would decrease. In the long-term, stand vigor would be maintained. Crowns of existing trees would become fuller and canopy cover would increase from post harvest levels. Eventually canopy cover would return to near pretreatment levels. However, instead consisting of numerous smaller trees, the canopy would be formed from the crowns of fewer but larger trees. Collapse of roadside trees would decrease as height / diameters ratios of remaining trees would be such that trees were thick enough to provide support for the entire bole.

Prevention/Avoidance Strategies: Maintenance of canopy along road would slow/prevent the establishment and growth of competitive vegetation such as ceanothus as well as the seeding in of additional conifers.

Recommended Treatment: A **non-commercial density management (NDNM)** treatment that thins from below is the recommended treatment for unit 3-3. Retain trees greater than seven inches dbh. Space conifers on a 14’x14’ spacing. Retain hardwoods. Slash brush, handpile and burn piles as appropriate.

Silvicultural Options Considered: None.

UNIT 11-1
T.32S., R.4W., section 11

Stand Description: Unit 11-1 is a stand of pole and sawtimber size Douglas fir. The unit has been previously thinned under the Thin Horse timber sale. Many conifers are over 20”dbh. Understory consists of madrone, chinquapin, rhododendron, and ocean spray. While some areas are relatively open there is some understory development in places.

Analysis: Unit is in a designated Late Successional Reserve. Objectives for this land use allocation are focused on late successional habitat and the wildlife that it supports. Unit 11-1 is within the Galesville Reservoir SRMA but because of how unit is situated, visuals are not a concern. Unit is an older stand that is currently listed as CHU (Critical Habitat Unit). Conifers capable of responding to release are present. Some understory development is occurring.

Desired Future Condition/Results: The desired future condition resulting from this action would be a unit that had two very distinct canopy layers. The upper canopy layer would consist of primarily Douglas fir. Large hardwoods would be retained within the unit. The understory would consist of hardwoods, shrubs and Douglas-fir regeneration that are currently present and those that became established within canopy gaps created by the thinning. In the long-term the stand would become a three-storied stand as a middle canopy layer developed.

Prevention/Avoidance Strategies: Treatment that reduced stand density and canopy cover would help to keep larger hardwoods alive within the stand.

Recommended Treatment: A **commercial density management (CDM)** treatment that thins from below is the recommended treatment for unit 11-1. Mark to retain an average 60% canopy cover across the unit. Unlike prescriptions designed to increase or accelerate the growth of trees for wood volume, trees of a variety of conditions such as those containing decay, trees that have numerous and large branches, and trees with broken tops or past snow damage are to be retained in addition to trees that would be retained in a “traditional” commercial thin. Retain trees twenty inches and larger dbh. Where possible mark so that a variety of spacing of residuals will result. Tractor yard above road. Cable yard with one end suspension below road. Evaluate for need to treat fuels. Slash brush, handpile and burn piles as appropriate.

Silvicultural Options Considered: A treatment that would have retained less canopy cover was considered but was rejected due to wildlife habitat concerns and sizes of existing conifers.

UNITS 13-1a, 13-1b
T.32S., R.4W., section 13

Stand Description: Units 13-1a and 13-1b are young stands that have resulted from past timber harvests. The eastern sub-unit, 13-1a, was clearcut (Negro Creek #5) in 1969. The unit received a site preparation treatment and was planted after harvest. It was precommercially thinned at a 13'x13' spacing and was aerially fertilized. Conifer diameters range from 6-14" dbh with the average diameter being about eight inches. Snow breakage, wind breakage and tree collapse has occurred. Canopy closure is about 80%. Tree diameters are greatest in the eastern part of the unit. Live crown ratios are 20-40%. The western sub-unit, (Overlook #2) was clearcut in 1972. It was planted after harvest and it received a maintenance treatment to aid in seedling establishment. Portions of the unit were precommercially thinned at a 15'x15' spacing. Conifer spacing is clumpy. Conifer diameters range from 2-14" dbh with most being less than eight inches dbh. Parts of the sub-unit 13-1b are unstable as evidenced by blowdown and snow collapse trees. Hemlock, rhododendron, big leaf maple, chinquapin, oceanspray and bracken fern are present.

Analysis: These units are in a designated Late Successional Reserve. Objectives for this land use allocation are focused on late successional habitat and the wildlife that it supports. These units drain into Snow Creek, a 303d stream. Portions of the unit are overstocked. Smaller conifers capable of responding to release are present. While precommercial thinning has taken place within the unit, those treatments were designed primarily to produce wood volume. The current stand development trajectory will result in a loss of desired late successional stand characteristics such as: long crowns; large diameter branches; a mix of conifers, hardwoods, and shrubs; and canopy gaps. There is some instability within the stand, an indication that height-diameter ratios are too high and the diameter of some trees are not large enough to support the bole. Soils are potentially erosive.

Desired Future Condition/Results: The desired future condition resulting from this action would, in the short-term, be a stand that had reduced canopy cover. Reduction of the canopy would result in reduced competition on retained trees. Growth rates of the remaining trees would increase. Mortality of remaining conifers and hardwoods would decrease. There would be a hardwood component within the stand for a longer period of time. In the long-term, stand vigor would be maintained. Crowns of existing trees would become fuller and canopy cover would increase from post harvest levels. Eventually canopy cover would return to near pretreatment levels. However, instead consisting of numerous smaller trees, the canopy would be formed from the crowns of fewer but larger trees. The unit would retain or develop (where disturbance created canopy gaps and there was no understory canopy layer) into a stand of multiple canopy layers. The stand would contain scattered large hardwoods.

Prevention/Avoidance Strategies: Treatment that reduced stand density and canopy cover would help to keep hardwoods and shrubs within the stand where they currently are and would allow them to develop in areas where gaps in the canopy were created.

Recommended Treatment: A **commercial density management (CDM)** treatment that thins from below is the recommended treatment for **unit 13-1a**. Mark to retain 40-50% canopy cover across the unit. Unlike prescriptions designed to increase or accelerate the growth of trees for wood volume, trees of a variety of conditions such as those containing decay, trees that have numerous and large branches, and trees with broken tops or past snow damage are to be retained in addition to trees that would be retained in a “traditional” commercial thin. Retain trees twenty inches and larger dbh. Where possible mark so that a variety of spacing of residuals will result. Mark so that small openings (canopy gaps) are created. This may involve marking two-three adjacent trees. Thin and harvest cut stems to ninety (90) feet of streams. Cable yard with one end suspension. Thin the no harvest areas and areas of non-commercial conifers to twenty-five (25) feet of streams on a 16’x16’ to 18’x18’ spacing retaining some trees that would be felled as snags. Retain hardwoods. A **noncommercial density management treatment (NDNM)** that thins from below is recommended for **unit 13-1b**. Thin so that non-commercial residual trees at a 16’x16’ to 18’x18’ spacing. For both areas, evaluate for need to treat fuels. Slash brush, handpile and burn piles as appropriate.

Silvicultural Options Considered: A treatment that considered commercial density management of a greater number of acres was considered but was rejected because of access and yarding difficulties.

UNITS **13-2e, 13-2f, 13-2x**
 T.32S., R.4W., sections 13
 T.32S., R.3W., sections 18

Stand Description: Units 13-2e, 13-2f, and 13-2x are young stands that have resulted from past timber harvest. Portions of the combined unit were clearcut in 1962 and 1963 (Snow Creek #1 and Snow Creek #2). These areas received follow-up site preparation treatments and were planted, precommercially thinned at a 13'x13' spacing and aerially fertilized. The remaining portion of the combined unit (Overlook #2) was clearcut in 1970, planted, and precommercially thinned on a 15'x15' spacing. Unthinned areas exist within the unit. The overall unit is not uniform. **Units 13-2e and 13-2f:** These units are a stand of pole size Douglas-fir generally 8-16" dbh. Average diameter is estimated to be 10-12" dbh. Live crown ratios range from 30-60%. The understory is relatively open but does contain some incense cedar, rhododendron, chinquapin, bracken fern, and salal. **Unit 13-2x:** This unit contains a variety of stand types. There are areas of Douglas-fir 8-14" dbh mixed with scattered ponderosa pine of similar size. In some areas the pine are growing well. In other areas the pine are dying out of the unit from shade. Parts of the unit are single-storied with little or no understory vegetation. Parts of the unit are multi-storied with clumps of small chinquapin, madrone, big leaf maple, and salal. The northwest portion of the unit is highly influenced by serpentine soils. This area has Douglas-fir 2-10" dbh mix with incense cedar, oceanspray, manzanita, canyon live oak, madrone, and poison oak. Steep, potentially unstable areas exist along both sides of the creek.

Analysis: These units are in a designated Late Successional Reserve. Objectives for this land use allocation are focused on late successional habitat and the wildlife that it supports. Unit drains into Snow Creek, a 303d stream. Smaller conifers capable of responding to release are present. While precommercial thinning has taken place within the unit, those treatments were designed primarily to produce wood volume. The current stand development trajectory will result in a loss of desired late successional stand characteristics such as: long crowns; large diameter branches; a mix of conifers, hardwoods, and shrubs; and canopy gaps. Soils are potentially erosive. Some snow/wind damage has occurred in the past.

Desired Future Condition/Results: The desired future condition resulting from this action would, in the short-term, be a stand that had reduced canopy cover. Reduction of the canopy would result in reduced competition on retained trees. Growth rates of the remaining trees would be maintained or would increase. Mortality of remaining conifers and hardwoods would decrease. There would be a hardwood component within the stand for a longer period of time. In the long-term, stand vigor would be maintained. Crowns of existing trees would become fuller and canopy cover would increase from post harvest levels. Eventually canopy cover would return to near pretreatment levels. However, instead consisting of numerous smaller trees, the canopy would be formed from the crowns of fewer but larger trees. The unit would retain or develop (where disturbance created canopy gaps and there was no understory canopy layer) into a stand of multiple canopy layers. The stand would contain scattered large hardwoods.

Prevention/Avoidance Strategies: Treatment that reduced stand density and canopy cover would help to keep hardwoods and shrubs within the stand where they currently are and would allow them to develop in areas where gaps in the canopy were created.

Recommended Treatment: A **commercial density management (CDM)** treatment that thins from below is the recommended treatment for **sub-units 13-2e and 13-2f**. Mark to retain 40-50% canopy cover across these units. Unlike prescriptions designed to increase or accelerate the growth of trees for wood volume, trees of a variety of conditions such as those containing decay, trees that have numerous and large branches, and trees with broken tops or past snow damage are to be retained in addition to trees that would be retained in a “traditional” commercial thin. Favor retention of Douglas-fir but do retain a mix of Douglas-fir and ponderosa where large well-formed pines capable of remaining in the stand exist. Retain trees twenty inches and larger dbh. Where possible mark so that a variety of spacing of residuals will result. Mark so that small openings (canopy gaps) are created. This may involve marking two-three adjacent trees. Thin and harvest cut stems to 125 (125) feet of streams. Yarding of trees from the unit will require a variety of methods including: cable yard with one end suspension and tractor. Thin any no harvest areas and areas of non-commercial conifers to twenty-five (25) feet of streams on a 20’x20’ spacing. Retain hardwoods. A **noncommercial density management treatment (NDNM)** that thins from below is recommended for **unit 13-2x**. Thin excess conifers less than 10”dbh on approximate 20’x20’ spacing. Fall excess conifer stems that are 7” dbh and less. Girdle excess conifer stems 7-10”dbh to obtain benefits of thinning and to provide small diameter snags. Retain hardwoods. Evaluate for need to treat fuels on both units. Slash brush, handpile and burn piles as appropriate. Pile burning and thinning of 7-10” dbh stems may need to occur in two or more operations.

Silvicultural Options Considered: A treatment that would have yielded a commercial product from a larger number of acres was considered but was rejected because of the additional yarding costs that would have been incurred.

UNIT 19N-2
T.31S., R.4W., section 19

Stand Description: Unit 19N-2 is a young stand that has resulted from a past timber harvest. The unit was clearcut in 1969. The unit was Meadow Creek #2. The unit was planted after harvest, was precommercially thinned on a 12'x12' spacing, and was aerially fertilized. Unit 19N-2 is currently composed of small-size Douglas-fir poles generally 6-10" dbh with an estimated average diameter of 8" dbh. Hardwood species present include madrone and big leaf maple. Shrub species include hazel/oceanspray, rhododendron, salal, huckleberry, and manzanita. Salal and bracken fern are present. The understory is relatively open.

Analysis: This area is designated Late Successional Reserve. Objectives for this land use allocation are focused on late successional habitat and the wildlife that it supports. Existing pole size conifers are capable of responding to a treatment that reduces competition from adjacent vegetation. While precommercial thinning has taken place within the unit, those treatments were designed primarily to produce wood volume. The current stand development trajectory will result in a loss of desired late successional stand characteristics such as: long crowns; large diameter branches; a mix of conifers, hardwoods, and shrubs; and canopy gaps.

Desired Future Condition/Results: The desired future condition resulting from this action would, in the short-term, be a stand that had 30-40% canopy cover retained across the unit. Reduction of the canopy to this level would result in reduced competition on retained trees. Growth rates of the remaining trees would increase. Mortality of remaining conifers and hardwoods would decrease. The stand would be two-storied. In the long-term, stand vigor would be maintained. Crowns of existing trees would become fuller and canopy cover would increase from post harvest levels. Eventually canopy cover would return to near pretreatment levels. However, instead consisting of numerous smaller trees, the canopy would be formed from the crowns of fewer but larger trees. Large hardwoods would be part of the stand.

Prevention/Avoidance Strategies: Enlarging growing space through a density management treatment while trees are capable of responding will allow more rapid growth to occur and will result in a quicker attainment of a forest stand with characteristics of older forests. Timely treatment will prevent growth from slowing and hardwoods from dying out of the stand by being overtopped.

Recommended Treatment: A **commercial density management (CDM)** treatment that thins from below is the recommended treatment for **unit 19N-2**. Mark to retain an average 30-40% canopy cover across the unit. Unlike prescriptions designed to increase or accelerate the growth of trees for wood volume, trees of a variety of conditions such as those containing decay, trees that have numerous and large branches, and trees with broken tops or past snow damage are to be retained in addition to trees that would be retained in a "traditional" commercial thin. Retain trees twenty inches and larger dbh. Where possible mark so that a variety of spacing of residuals will result. Mark so that small openings (canopy gaps) are created. This may involve marking two-three adjacent trees. Thin and harvest cut stems to sixty (60) feet of streams. Cable yard with one end suspension. Create three, quarter acre openings within unit 19N-2 where all but 2-4

conifers are removed. Conifers retained in the openings should be those that are most likely to remain standing after wind and/or snow events. Situate openings on stable slopes and a minimum of 180 feet from draws. Thin the no harvest areas and areas of non-commercial conifers to twenty-five (25) feet of streams on a 16'x16' to 18'x18' spacing retaining some trees that would be felled as snags. Retain hardwoods. Evaluate for need to treat fuels. Slash brush, handpile and burn piles as appropriate.

Silvicultural Options Considered: Retaining a higher level of canopy cover was considered but was not proposed as it was desirable to move the stand to one with characteristics of older forests as quickly as possible. Retaining a higher level of canopy would have also increased the possibility of additional entries being needed to develop a desired stand.

UNITS 19N-3a, 19N-3b
T.31S., R.4W., section 19

Stand Description: Units 19N-3a and 19N-3b are young stands that have resulted from past timber harvest. The unit was clearcut in 1969 as Meadow Creek #4. The unit was planted after harvest, was precommercially thinned on a 12'x12' spacing, and was aerially fertilized. Unit 19N-3a is currently composed of small-size Douglas-fir poles generally 6-10" dbh with an estimated average diameter of 8" dbh. Hardwood species present include madrone and big leaf maple. Shrub species include hazel/oceanspray, rhododendron, salal, huckleberry, and manzanita. Salal and bracken fern are present. The understory is relatively open. Unit 19N-3b is similar but contains smaller diameter conifers.

Analysis: These units are in a designated Late Successional Reserve. Objectives for this land use allocation are focused on late successional habitat and the wildlife that it supports. Existing conifers are capable of responding to a treatment that reduces competition from adjacent vegetation. While precommercial thinning has taken place within the unit, those treatments were designed primarily to produce wood volume. The current stand development trajectory will result in a loss of desired late successional stand characteristics such as: long crowns; large diameter branches; a mix of conifers, hardwoods, and shrubs; and canopy gaps.

Desired Future Condition/Results: The desired future condition resulting from this action would, in the short-term, be a stand that had reduced canopy cover. Reduction of the canopy would result in reduced competition on retained trees. Growth rates of the remaining trees would increase. Mortality of remaining conifers and hardwoods would decrease. The stand would be two-storied. In the long-term, stand vigor would be maintained. Crowns of existing trees would become fuller and canopy cover would increase from post harvest levels. Eventually canopy cover would return to near pretreatment levels. However, instead consisting of numerous smaller trees, the canopy would be formed from the crowns of fewer but larger trees. Large hardwoods would be part of the stand.

Prevention/Avoidance Strategies: Enlarging growing space through a density management treatment while trees are capable of responding will allow more rapid growth to occur and will result in a quicker attainment of a forest stand with characteristics of older forests. Timely treatment will prevent growth from slowing and hardwoods from dying out of the stand by being overtopped.

Recommended Treatment: A **commercial density management (CDM)** treatment that thins from below is the recommended treatment for **unit 19N-3a**. Mark to retain 30-40% canopy cover across the unit. Unlike prescriptions designed to increase or accelerate the growth of trees for wood volume, trees of a variety of conditions such as those containing decay, trees that have numerous and large branches, and trees with broken tops or past snow damage are to be retained in addition to trees that would be retained in a "traditional" commercial thin. Retain trees twenty inches and larger dbh. Where possible mark so that a variety of spacing of residuals will result. Mark so that small openings (canopy gaps) are created. This may involve marking two-three adjacent trees. Thin and harvest cut stems to sixty (60) feet of streams. Cable yard with one end

suspension. Thin the no harvest areas and areas of non-commercial conifers to twenty-five (25) feet of streams on a 20'x20' spacing retaining some trees that would be felled as snags. Retain hardwoods. A **non-commercial density management treatment (NDNM)** that thins from below is recommended for **unit 19N-3b**. Thin non-commercial residual trees at a 20'x20' spacing. Evaluate for need to treat fuels on both units. Slash brush, handpile and burn piles as appropriate.

Silvicultural Options Considered: Retaining a higher level of canopy cover was considered but was not proposed as it was desirable to move the stand to one with characteristics of older forests as quickly as possible. Retaining a higher level of canopy would have also increased the possibility of additional entries being needed to develop a desired stand. Harvest of trees within unit 19N-3b was considered but was not proposed as yarding across a draw would be required if done by cable and the value of materials recovered would not support helicopter yarding.

UNIT 19N-6
T.31S., R.4W., section 19

Stand Description: Unit 19N-6 is a young stand that has resulted from a past timber harvest. The unit was clearcut in 1979 as Sugar Meadows #15. The unit was planted after harvest and was precommercially thinned on a 13'x13' spacing. Unit 19N-6 is currently composed of small-size Douglas-fir poles generally 4-10" dbh with an estimated average diameter of less than 7" dbh. The unit contains some areas where conifers are clumpy and spacing in narrower possibly from conifers seeding in from trees outside of the unit. Canopy has not yet closed throughout the unit. Madrone, canyon live oak, big leaf maple, oceanspray, thimbleberry, Oregon grape, and sword fern are present.

Analysis: This area is designated Late Successional Reserve. Objectives for this land use allocation are focused on late successional habitat and the wildlife that it supports. Existing conifers are capable of responding to a treatment that reduces competition from adjacent vegetation. While precommercial thinning has taken place within the unit, those treatments were designed primarily to produce wood volume. The current stand development trajectory will result in a loss of desired late successional stand characteristics such as: long crowns; large diameter branches; a mix of conifers, hardwoods, and shrubs; and canopy gaps. Treatment at this time would help to maintain hardwood and shrub species in the unit.

Desired Future Condition/Results: The desired future condition resulting from this action would be a stand that had stand densities reduced. Reduction of densities would result in reduced competition on retained trees. Growth rates of the remaining trees would be maintained or would increase. Mortality of remaining conifers and hardwoods would decrease. There would be a hardwood component within the stand for a longer period of time. In the long-term, stand vigor would be maintained. Crowns of existing trees would become fuller and canopy cover would increase from post harvest levels. Eventually canopy cover would return to near pretreatment levels. However, instead consisting of numerous smaller trees, the canopy would be formed from the crowns of fewer but larger trees. Large hardwoods would be part of the stand.

Prevention/Avoidance Strategies: Enlarging growing space through a density management treatment while trees are capable of responding will allow more rapid growth to occur and will result in a quicker attainment of a forest stand with characteristics of older forests. Timely treatment will prevent growth from slowing and hardwoods from dying out of the stand by being overtopped. Timely treatment will also help to maintain stand stability by creating conditions where tree diameter growth rates are enough to support the weight of the tree.

Recommended Treatment: A **non-commercial density management (NDNM) treatment** is recommended for **unit 19N-6**. Space conifers seven inches and less on a variable spacing (crown space) so that there is 4-8 feet between crowns of residual trees. Retain hardwoods. On stump sprouted hardwoods treat so as to retain only one or two main stems. Evaluate for need to treat fuels. Slash brush, handpile and burn piles as appropriate.

Silvicultural Options Considered: None.

UNIT 19N-7
T.31S., R.4W., section 19

Stand Description: Unit 19N-7 is a small strip of younger conifers that developed within the right-of-way of a road 32-4-9. Douglas-fir is the primary species present. Diameters range from 2-10" dbh with the average diameter being about six inches. Some areas of the unit have experienced snow/wind damage. Big leaf maple is present. Aside from the initial timber harvest that occurred with the building of the road, no treatment other than roadside brushing has occurred in this unit.

Analysis: This area is designated Late Successional Reserve. Objectives for this land use allocation are focused on late successional habitat and the wildlife that it supports. Existing conifers are capable of responding to a treatment that reduces competition from adjacent vegetation. The unit is overstocked. Growth will slow with current stocking levels. The unit parallels a road and has a stand of older trees downslope of it. In addition to promoting characteristics of older forest stands, it is desired to "blend" unit with the adjacent stand to decrease sharp transitions from old stand to road right-of-way to road.

Desired Future Condition/Results: The desired future condition resulting from this action would, in the short-term, be a stand that had stocking levels reduced but still retained a fairly high level of canopy cover. Reduction of the canopy would result in reduced competition on retained trees. Growth rates of the remaining trees would increase. Mortality of remaining conifers and hardwoods would decrease. In the long-term, stand vigor would be maintained. Crowns of existing trees would become fuller and overall canopy cover would increase from post harvest levels. Eventually canopy cover would return to near pretreatment levels. However, instead consisting of numerous smaller trees, the canopy would be formed from the crowns of fewer but larger trees. Collapse of roadside trees would decrease as height /diameters ratios of remaining trees would be such that trees were thick enough to provide support for the entire bole.

Prevention/Avoidance Strategies: Maintenance of canopy along road would slow/prevent the establishment and growth of competitive vegetation such as ceanothus as well as the seeding in of additional conifers.

Recommended Treatment: A **commercial density management (CDM)** treatment that thins from below is the recommended treatment for unit 19N-7. Mark to retain 50% canopy cover across the unit. Retain trees twenty inches and larger dbh. In areas containing only non-commercial size conifers space conifers on a 14'x14' spacing. Retain hardwoods. Tractor/shovel yard from road. Evaluate for need to treat fuels. Slash brush, handpile and burn piles as appropriate.

Silvicultural Options Considered: None.

UNIT 29-1
T.31S., R.4W., section 29

Stand Description: Unit 29-1 is a stand of scattered large Douglas-fir over an understory of advanced Douglas-fir regeneration, hemlock, and madrone. Some large ponderosa pines are present. Larger overstory conifers generally range from 36-40" dbh. Overstory conifers are showing signs of decadence such as dead tops, thinning crowns, and dead limbs.

Analysis: This area is designated Matrix. Stand does not currently meet RMP guidelines for regeneration harvest. Although overstory is starting to decline much of the unit does not contain enough large overstory conifers to fulfill leave tree requirements for regeneration harvest. Whether or not timber harvest would be economical is questionable. Advanced conifer regeneration, pole size conifers, and some larger remnant conifers are capable of responding to a thinning/release treatment. Areas of the unit are overstocked with smaller conifers and other vegetation. Treatment would be for the management of the understory for future harvest. Fuel loadings and ladder fuels are a concern in unit.

Desired Future Condition/Results: The desired future condition resulting from this action would, in the short-term, be a unit that had two very distinct canopy layers. The upper canopy layer would consist of a mixture of primarily mature Douglas fir and scattered pine. Trees within this layer would provide larger structural elements such as future snags and larger coarse woody debris. Canopy cover would be light, as approximately ten to fifteen large conifers per acre would be present. The understory canopy layer would consist of existing Douglas-fir regeneration and hardwoods. Stand structure would not change much. There would be a reduction in stems and a reduction in the number of shrubs in the unit. In the long-term, the stand would retain this two-storied structure. There would be 3-5 larger hardwoods/acre.

Prevention/Avoidance Strategies: Maintenance of canopy cover and subsequent treatments such as fertilization to increase canopy cover and density would slow/prevent the establishment and growth of competitive vegetation. Periodic underburning or other fuels treatment would retard the development of ladder fuels.

Recommended Treatment: A non-commercial density management /fuels (NDNM/Fuels) treatment is recommended for unit 29-1. Stand density (stocking levels) should be reduced by thinning understory vegetation seven inches and less in diameter so that conifers are retained on a 16'x16' to 20'x20' spacing and hardwoods are retained on an overlapping 40'x40' spacing. Treatment should be a thinning from below with the emphasis on retaining vigorous, well-formed conifers and hardwoods. Where possible, preference for retention should be given to site adapted pine and oak species. Prune leave trees to reduce ladder fuels. Slash brush, handpile slash and burn piles. Evaluate unit after treatment to determine if there are areas within the unit that do not meet current stocking standards. Plant and conduct follow-up establishment treatments if areas exist. Evaluate for fuels build-up 3-5 years after initial treatment. Do follow-up fuels treatments such as slashing/handpiling/ burning piles as needed to slow development of ladder fuels. Seed with a mixture of native forage plants if seed is available.

Silvicultural Options Considered: A regeneration harvest was considered at one time but was rejected due to the number of large conifers present in the unit.

UNIT 29-2a
T.31S., R.4W., section 29

Stand Description: Unit 29-2a is a young stand that has resulted from a past timber harvest. The unit is part of a larger unit that was clearcut in 1952 and planted in 1960. The unit currently consists of a Douglas-fir poles generally 8-14” in diameter. The unit contains little understory vegetation that primarily consists of sword fern, madrone and big leaf maple. Self-thinning of the stand is starting to occur. There are trees with broken tops and trees that have collapsed. Live crown ratios are generally 20-30%.

Analysis: These units are in a designated Late Successional Reserve. Objectives for this land use allocation are focused on late successional habitat and the wildlife that it supports. The unit is adjacent to an Owl Core Area. Existing conifers are capable of responding to a treatment that reduces competition. Live crown ratios are low however, so trees are losing their ability to respond to a release. Suppression mortality and collapse of individual trees is occurring. The current stand development trajectory will result in a loss of desired late successional stand characteristics such as: long crowns; large diameter branches; a mix of conifers, hardwoods, and shrubs; and canopy gaps. Soils are potentially erosive.

Desired Future Condition/Results: The desired future condition resulting from this action would, in the short-term, be a stand that had reduced canopy cover. Reduction of the canopy would result in reduced competition on retained trees. Growth rates of the remaining trees would be maintained or would increase. Mortality of remaining conifers and hardwoods would decrease. The stand would be two-storied. In the long-term, stand vigor would be maintained. Crowns of existing trees would become fuller and canopy cover would increase from post harvest levels. Eventually canopy cover would return to near pretreatment levels. However, instead consisting of numerous smaller trees, the canopy would be formed from the crowns of fewer but larger trees. Large hardwoods would be part of the stand.

Prevention/Avoidance Strategies: Enlarging growing space through a density management treatment while trees are capable of responding will allow more rapid growth to occur and will result in a quicker attainment of a forest stand with characteristics of older forests. Timely treatment will prevent growth from slowing and hardwoods from dying out of the stand by being overtopped.

Recommended Treatment: A commercial density management (CDM) treatment that thins from below is the recommended treatment for **unit 29-2a**. Mark to retain 40-60% canopy cover across the unit. Retain 60% canopy in the western part of the unit along the owl core area. Vary the mark so that less canopy is retained going east so that there is 40% canopy along the road. Unlike prescriptions designed to increase or accelerate the growth of trees for wood volume, trees of a variety of conditions such as those containing decay, trees that have numerous and large branches, and trees with broken tops or past snow damage are to be retained in addition to trees that would be retained in a “traditional” commercial thin. Retain trees twenty inches and larger dbh. Where possible mark so that a variety of spacing of residuals will result. Mark so that small openings (canopy gaps) are created. This may involve marking two-three adjacent

trees. Thin and harvest cut stems to ninety (90) feet of streams. Cable yard with one end suspension. Thin the no harvest areas and areas of non-commercial conifers to twenty-five (25) feet of streams on a 16'x16' to 18'x18' spacing retaining some trees that would be felled as snags. Retain hardwoods. Evaluate for need to treat fuels on both units. Slash brush, handpile and burn piles as appropriate.

Silvicultural Options Considered: Retention of less canopy cover was considered but was not proposed as it was desirable to maintain canopy cover next to the Owl Core Area. No treatment is proposed for unit 29-2a under Alternative 3.

UNIT 29-3
T.31S., R.3W., section 29

Stand Description: Unit 29-3 is a mixed unit. Much of the unit is the result of past timber harvests, several clearcuts done in 1952 and 1967. These areas consist of advanced Douglas-fir regeneration mixed with areas of ponderosa pine and incense cedar regeneration, madrone, manzanita, and ceanothus. Limited amounts of white fir can be found in the draws. Most of the conifer stems range from 4-10" dbh with several areas having conifers that are 14-18" dbh.

Analysis: This area is designated Matrix. Stand does not currently meet RMP guidelines for regeneration harvest. Although some areas some areas could yield a commercial product (small poles /posts), it is questionable whether or not timber harvest at this time would be economical. Advanced conifer regeneration and pole size conifers are capable of responding to a thinning/release treatment. Areas of the unit are overstocked with smaller conifers and other vegetation. Fuel loadings and ladder fuels are a concern.

Desired Future Condition/Results: The desired future condition resulting from this action would be a stand that had stand densities reduced. Reduction of densities would result in reduced competition on retained trees. Growth rates of the remaining trees would be maintained or would increase. Mortality of remaining conifers and hardwoods would decrease. There would be a hardwood component within the stand for a longer period of time. Ladder fuels within the stand would also be reduced. Slash from the thinning/release would be piled and burned. In the long-term, stand vigor would be maintained. Crowns of existing trees would become fuller and canopy cover would increase from post treatment levels. Eventually canopy cover would return to near pretreatment levels. However, instead consisting of numerous smaller trees, the canopy would be formed from the crowns of fewer but larger trees.

Prevention/Avoidance Strategies: Maintenance of canopy cover and subsequent treatments such as fertilization to increase canopy cover and density would slow/prevent the establishment and growth of competitive vegetation. Periodic underburning or other fuels treatment would retard the development of ladder fuels.

Recommended Treatment: A non-commercial density management /fuels (NDNM/Fuels) treatment is recommended for unit 29-3. Stand density (stocking levels) should be reduced by thinning understory vegetation seven inches and less in diameter so that conifers are retained on a 16'x16' to 20'x20' spacing and hardwoods are retained on an overlapping 40'x40' spacing. Treatment should be a thinning from below with the emphasis on retaining vigorous, well-formed conifers and hardwoods. Where possible, preference for retention should be given to site adapted pine and oak species. Prune leave trees to reduce ladder fuels. Slash brush, handpile slash and burn piles. Evaluate unit after treatment to determine if there are areas within the unit that do not meet current stocking standards. Plant and conduct follow-up establishment treatments if areas exist. Evaluate for fuels build-up 3-5 years after initial treatment. Do follow-up fuels treatments such as slashing/handpiling/ burning piles or underburning as needed to slow development of ladder fuels. Seed with a mixture of native forage plants if seed is available.

Silvicultural Options Considered: A treatment that spaced conifers at a closer spacing was considered but was rejected due to fuels concerns and the numbers of ponderosa pine in the unit.

UNIT 6-3
T.32S., R.3W., section 6

Stand Description: Unit 6-3 is an unentered, multi-storied stand of mature and older Douglas-fir 24-48" dbh mixed with smaller western hemlock, white fir, and occasional incense cedar and sugar pine. The understory consists of areas of rhododendron, vine maple, chinquapin with salal, bear grass, Oregon grape, and oceanspray. The unit contains areas where the understory is open. A limited amount of conifer regeneration is present.

Analysis: This area is designated Matrix. Stand meets RMP guidelines for regeneration harvest. Unit drains into Snow Creek, a 303d stream. Limited conifer regeneration exists within the unit. Soils are granitic so unit is managed on a Structural Retention Silviculture System.

Desired Future Condition/Results: The desired future condition resulting from this action would, in the short-term, be a unit that had two very distinct canopy layers. The upper canopy layer would consist of a mixture of primarily mature Douglas fir with limited amounts of hemlock, white fir, incense cedar and sugar pine. Trees within this layer would provide larger structural elements such as future snags and larger coarse woody debris. Canopy cover would be 40% or greater, as approximately twenty large conifers per acre would remain. The understory canopy layer would consist of existing Douglas-fir regeneration and regeneration that became established within a few years following harvest, treatment of activity fuels, and other site preparation. In the long-term, the stand would develop into once again into a multi-storied stand. A component of hardwoods would remain.

Prevention/Avoidance Strategies: Maintenance of some canopy cover combined with future understory treatments designed to produce and maintain multi-storied stands will help to create conditions that resemble natural ecosystems in composition, structure and function.

Recommended Treatment: A Structural Retention Silvicultural System with stand regeneration through a **Regeneration Harvest (RH)** is recommended for **unit 6-3**. Harvest merchantable conifers greater than six inches dbh. Emphasize retention of existing conifer regeneration. Retain an average of eighteen conifers across the range of diameters over 20" dbh per acre. Retained conifers should approximate species composition of the present stand and should be dispersed throughout the unit. Retained conifers should consist of both sound and cull trees. Retain two additional conifers per acre for future coarse woody debris. Retain 3-5 larger hardwoods per acre where present. Harvest to one site potential tree length of non-fishbearing streams, two site potential tree lengths of fishbearing streams (Snow Creek). Site potential tree length for this area is 170 feet. Cable yard. Evaluate conifer regeneration within unit and in buffers after harvest. Where needed for growth, thin no harvest areas (stream buffers) to twenty-five (25) feet of streams and areas within the unit on a 16' x 16' spacing retaining some trees that would be felled as snags. Slash shrubs and damaged conifer regeneration, handpile and burn piles. Where unit does not meet stocking standards, plant with a mixture of 60% Douglas fir and 40% minor species predominantly rust resistant sugar pine. Conduct follow-up maintenance/protection treatments through stand establishment. Follow-up treatments may include treatments such as handpiling and burning of piles to reduce activity fuels.

Silvicultural Options Considered: No harvest or treatment is proposed under Alternative 3.

UNIT 7-1
T.32S., R.3W., section 7

Stand Description: Unit 7-1 is a young stand that has resulted from a past timber harvest. The unit was clearcut in 1960 and 1961 as Snow Creek A, C, and C1. Following harvest the unit was planted. The unit was precommercially thinned on a 12' x 12' spacing. Parts of the unit were aerially fertilized. Unit 7-1 is a mixed unit. The lower portions of the slope within the western portion of the unit consists of pole size Douglas-fir generally 8-16" dbh with an estimated average diameter of 10" dbh. Diameters range from 6-12" dbh away from the draws. Live crown ratios are 20-30%. Hardwoods are dying out from shade and there is little understory. What understory is present consists of sword fern, vine maple, and limited big leaf maple. The northern and eastern portions of the unit are similar only with smaller conifers and more shrubs. Diameters are 2-8" dbh. The understory contains rhododendron, salal, as well as tree-form and brush-form chinquapin. Some larger Douglas-fir poles are found near the main road.

Analysis: This area is designated Late Successional Reserve. Objectives for this land use allocation are focused on late successional habitat and the wildlife that it supports. Existing conifers are capable of responding to a treatment that reduces competition from adjacent vegetation. While precommercial thinning has taken place within the unit, those treatments were designed primarily to produce wood volume. The current stand development trajectory will result in a loss of desired late successional stand characteristics such as: long crowns; large diameter branches; a mix of conifers, hardwoods, and shrubs; and canopy gaps. Treatment at this time would help to maintain hardwood and shrub species in the unit. Access for cable yarding, size of material to be removed, and cost of helicopter yarding make economical removal of merchantable material questionable.

Desired Future Condition/Results: The desired future condition resulting from this action would be a stand that had stand densities reduced. Reduction of densities would result in reduced competition on retained trees. Growth rates of the remaining trees would be maintained or would increase. Mortality of remaining conifers and hardwoods would decrease. There would be a hardwood component within the stand for a longer period of time. In the long-term, stand vigor would be maintained. Crowns of existing trees would become fuller and canopy cover would increase from post harvest levels. Eventually canopy cover would return to near pretreatment levels. However, instead consisting of numerous smaller trees, the canopy would be formed from the crowns of fewer but larger trees. Large hardwoods would be part of the stand.

Prevention/Avoidance Strategies: Enlarging growing space through a density management treatment while trees are capable of responding will allow more rapid growth to occur and will result in a quicker attainment of a forest stand with characteristics of older forests. Timely treatment will prevent growth from slowing and hardwoods from dying out of the stand by being overtopped. Timely treatment will also help to maintain stand stability by creating conditions where tree diameter growth rates are enough to support the weight of the tree.

Recommended Treatment: A **non-commercial density management (NDNM) treatment** is recommended for **unit 7-1**. Thin excess conifers less than 10”dbh on approximate 20’x20’ spacing. Fall excess conifer stems that are 7” dbh and less. Girdle excess conifer stems 7-10”dbh to obtain benefits of thinning and to provide small diameter snags. Retain hardwoods. Evaluate for need to treat fuels. Slash brush, handpile and burn piles as appropriate. Pile burning and thinning of 7-10” dbh stems may need to occur in two or more operations.

Silvicultural Options Considered: A commercial density management treatment was proposed for Unit 7-1 but was rejected due to access and/or cost of yarding.

UNIT 7-2
T.32S., R.3W., section 7

Stand Description: Unit 7-2 is a young stand that has resulted from a past timber harvest. The unit was clearcut in 1969 a Snow Creek West #1. The unit received a site preparation treatment and was planted after harvest. It was precommercially thinned at a 13'x13' spacing and was aerially fertilized. Conifer diameters range from 6-14" dbh with the average diameter being about ten inches. Conifer diameters decrease going downslope. Limited numbers of stressed ponderosa pine are present. Live crown ratios are 30-40%. Hemlock, dogwood, rhododendron, big leaf maple, and sword fern are present. Alder can be found in the draw.

Analysis: This unit is in a designated Late Successional Reserve. Objectives for this land use allocation are focused on late successional habitat and the wildlife that it supports. These units drain into Snow Creek, a 303d stream. Portions of the unit are overstocked. Smaller conifers capable of responding to release are present. While precommercial thinning has taken place over most of the unit, the treatment was designed primarily to produce wood volume. The current stand development trajectory will result in a loss of desired late successional stand characteristics such as: long crowns; large diameter branches; a mix of conifers, hardwoods, and shrubs; and canopy gaps. Soils are potentially erosive.

Desired Future Condition/Results: The desired future condition resulting from this action would, in the short-term, be a stand that had 40-50% canopy cover. Reduction of the canopy would result in reduced competition on retained trees. Growth rates of the remaining trees would increase. Mortality of remaining conifers and hardwoods would decrease. There would be a hardwood component within the stand for a longer period of time. In the long-term, stand vigor would be maintained. Crowns of existing trees would become fuller and canopy cover would increase from post harvest levels. Eventually canopy cover would return to near pretreatment levels. However, instead consisting of numerous smaller trees, the canopy would be formed from the crowns of fewer but larger trees. The unit would retain or develop (where disturbance created canopy gaps and there was no understory canopy layer) into a stand of multiple canopy layers. The stand would contain scattered large hardwoods.

Prevention/Avoidance Strategies: Treatment that reduced stand density and canopy cover would help to keep hardwoods and shrubs within the stand where they currently are and would allow them to develop in areas where gaps in the canopy were created.

Recommended Treatment: A **commercial density management (CDM)** treatment that thins from below is the recommended treatment for **unit 7-2**. Mark to retain 40-50% canopy cover across the unit. Unlike prescriptions designed to increase or accelerate the growth of trees for wood volume, trees of a variety of conditions such as those containing decay, trees that have numerous and large branches, and trees with broken tops or past snow damage are to be retained in addition to trees that would be retained in a "traditional" commercial thin. Retain trees twenty inches and larger dbh. Where possible mark so that a variety of spacing of residuals will result. Mark so that small openings (canopy gaps) are created. This may involve marking two-three adjacent trees. Thin and harvest cut stems to ninety (90) feet of streams. Cable yard with one

end suspension. Thin the no harvest areas and areas of non-commercial conifers to twenty-five (25) feet of streams on a 16'x16' to 18'x18' spacing retaining some trees that would be felled as snags. Remove ponderosa pine unless tree is dominant and able to remain in the stand for the long-term. Retain hardwoods. Evaluate for need to treat fuels. Slash brush, handpile and burn piles as appropriate.

Silvicultural Options Considered: A treatment that reduce canopy cover to 30-40% was considered but was rejected because of soils and water quality concerns.

UNITS 17-1a, 17-1b
T.32S., R.3W., section 17

Stand Description: Units 17-1a and 17-1b are young stands that have resulted from a past timber harvest. The combined unit was clearcut in 1961 as Snow Creek X+Y. The unit was planted after harvest. It was precommercially thinned at a 12'x12' spacing and was aerially fertilized. Unit 17-1a is a multistoried stand of Douglas-fir poles that are generally 8-12" dbh. These poles are mixed with a layer of Douglas-fir 4-8" dbh and hardwoods. There is scattered white fir and hemlock as well as some older, larger Douglas-fir. Hardwoods as well as smaller Douglas-fir are spindly. Ponderosa pine and at least one knobcone pine can be found. Shrubs present include: rhododendron, chinquapin, manzanita, salal, willow and vine maple. Unit 17-1b is similar to 17-1a only growing conditions are better as it is nearer Snow Creek. Larger Douglas-fir is near the creek. Unit 17-1b contains areas that are single-storied as well as areas of more widely spaced conifers where there is an understory of shrubs and small hardwoods.

Analysis: These units are in a designated Late Successional Reserve. Objectives for this land use allocation are focused on late successional habitat and the wildlife that it supports. These units drain into Snow Creek, a 303d stream. Portions of the unit are overstocked. Smaller conifers capable of responding to release are present. While precommercial thinning has taken place within the unit, those treatments were designed primarily to produce wood volume. The current stand development trajectory will result in a loss of desired late successional stand characteristics such as: long crowns; large diameter branches; a mix of conifers, hardwoods, and shrubs; and canopy gaps. Soils are potentially erosive. Unit 17-1 contains a buried fiber-optic cable along the road.

Desired Future Condition/Results: The desired future condition resulting from this action would, in the short-term, be a stand that had reduced canopy cover. Reduction of the canopy would result in reduced competition on retained trees. Growth rates of the remaining trees would increase. Mortality of remaining conifers and hardwoods would decrease. There would be a hardwood component within the stand for a longer period of time. In the long-term, stand vigor would be maintained. Crowns of existing trees would become fuller and canopy cover would increase from post harvest levels. Eventually canopy cover would return to near pretreatment levels. However, instead consisting of numerous smaller trees, the canopy would be formed from the crowns of fewer but larger trees. The unit would retain or develop (where disturbance created canopy gaps and there was no understory canopy layer) into a stand of multiple canopy layers. The stand would contain scattered large hardwoods.

Prevention/Avoidance Strategies: Treatment that reduced stand density and canopy cover would help to keep hardwoods and shrubs within the stand where they currently are and would allow them to develop in areas where gaps in the canopy were created.

Recommended Treatment: A **commercial density management (CDM)** treatment that thins from below is the recommended treatment for **unit 17-1a**. Mark to retain 40-50% canopy cover across the unit. Unlike prescriptions designed to increase or accelerate the growth of trees for

wood volume, trees of a variety of conditions such as those containing decay, trees that have numerous and large branches, and trees with broken tops or past snow damage are to be retained in addition to trees that would be retained in a “traditional” commercial thin. Retain trees twenty inches and larger dbh. Where possible mark so that a variety of spacing of residuals will result. Mark so that small openings (canopy gaps) are created. This may involve marking two-three adjacent trees. Use the Snow Creek road (32-3-5) as the western harvest boundary. Within the unit, thin and harvest cut stems to one hundred twenty five (125) feet of streams. Tractor yard. Thin the no harvest areas and areas of non-commercial conifers to twenty-five (25) feet of streams on a 20’x20’ spacing retaining some trees that would be felled as snags. Retain hardwoods. A **noncommercial density management treatment (NDNM)** that thins from below is recommended for **unit 17-1b**. Thin excess conifers less than 10”dbh on approximate 20’x20’ spacing. Fall excess conifer stems that are 7” dbh and less. Girdle excess conifer stems 7-10”dbh to obtain benefits of thinning and to provide small diameter snags. Retain hardwoods. Thin in such a way that shade on Snow Creek remains constant or nearly so (so that any change in shade would not cause a rise in stream temperature) from pretreatment to post-treatment. Evaluate for need to treat fuels. Slash brush, handpile and burn piles as appropriate. Pile burning and thinning of 7-10” dbh stems may need to occur in two or more operations.

Silvicultural Options Considered: A proposal that did not include treatment of areas near Snow Creek (17-1b) was considered but was rejected because treatment of the stand at this time would accelerate growth, the development/maintenance of an understory and quicker attainment of older forest characteristics.

UNIT 18-1a
T.32S., R.3W., section 18

Stand Description: Unit 18-1a is a young stand that has resulted from a past timber harvest. The unit was clearcut in 1964 as Snow Creek #1. The unit was planted after harvest. It was precommercially thinned at a 12'x12' spacing and was aerially fertilized. Conifer diameters range from 4-20" dbh with the average diameter being about twelve inches. Other conifers present include hemlock, white fir, and incense cedar. Shrubs present include rhododendron, big leaf maple, dogwood, and salal. Some small Douglas-fir regeneration is present.

Analysis: This unit is in a designated Late Successional Reserve. Objectives for this land use allocation are focused on late successional habitat and the wildlife that it supports. This unit drains into Snow Creek, a 303d stream. Smaller conifers capable of responding to release are present. While precommercial thinning has taken place, the treatment was designed primarily to produce wood volume. The current stand development trajectory will result in a loss of desired late successional stand characteristics such as: long crowns; large diameter branches; a mix of conifers, hardwoods, and shrubs; and canopy gaps. Soils are potentially erosive.

Desired Future Condition/Results: The desired future condition resulting from this action would, in the short-term, be a stand that had 40-50% canopy cover. Reduction of the canopy would result in reduced competition on retained trees. Growth rates of the remaining trees would increase. Mortality of remaining conifers and hardwoods would decrease. There would be a hardwood component within the stand for a longer period of time. In the long-term, stand vigor would be maintained. Crowns of existing trees would become fuller and canopy cover would increase from post harvest levels. Eventually canopy cover would return to near pretreatment levels. However, instead consisting of numerous smaller trees, the canopy would be formed from the crowns of fewer but larger trees. The stand would contain scattered large hardwoods.

Prevention/Avoidance Strategies: Treatment that reduced stand density and canopy cover would help to keep hardwoods and shrubs within the stand where they currently are and would allow them to develop in areas where gaps in the canopy were created.

Recommended Treatment: A commercial density management (CDM) treatment that thins from below is the recommended treatment for **unit 18-1a**. Mark to retain 40-50% canopy cover across the unit. Unlike prescriptions designed to increase or accelerate the growth of trees for wood volume, trees of a variety of conditions such as those containing decay, trees that have numerous and large branches, and trees with broken tops or past snow damage are to be retained in addition to trees that would be retained in a "traditional" commercial thin. Retain trees twenty inches and larger dbh. Where possible mark so that a variety of spacing of residuals will result. Mark so that small openings (canopy gaps) are created. This may involve marking two-three adjacent trees. Thin and harvest cut stems to one hundred twenty-five (125) feet of streams. Cable yard with one end suspension. Thin the no harvest areas and areas of non-commercial conifers to twenty-five (25) feet of streams on a 16'x16' to 18'x18' spacing retaining some trees that would be felled as snags. Retain hardwoods. Evaluate for need to treat fuels. Slash brush, handpile and burn piles as appropriate.

Silvicultural Options Considered: A treatment that reduce canopy cover to 30-40% was considered but was rejected because of soils and water quality concerns.

UNIT 18-2
T.32S., R.3W., section 18

Stand Description: Unit 18-2 is a young stand that has resulted from a past timber harvest. The unit was clearcut in 1965 as Snow Creek #2. The unit received a site preparation treatment and was planted after harvest. Unit 18-2 was precommercially thinned at a 13'x13' spacing and was aerially fertilized. Above the upper spur road the unit consists of predominantly pole size Douglas-fir 4-16" dbh with the average diameter being about eight inches. Limited ponderosa pine and incense cedar are present as are dogwood, big leaf maple, Oregon grape, and salal. Canopy cover is 80-90%. The portion of the unit below the road is similar with smaller diameter conifers.

Analysis: This unit is in a designated Late Successional Reserve. Objectives for this land use allocation are focused on late successional habitat and the wildlife that it supports. These units drain into Snow Creek, a 303d stream. Conifers capable of responding to release are present. While precommercial thinning has taken place over most of the unit, the treatment was designed primarily to produce wood volume. The current stand development trajectory will result in a loss of desired late successional stand characteristics such as: long crowns; large diameter branches; a mix of conifers, hardwoods, and shrubs; and canopy gaps. Soils are potentially erosive.

Desired Future Condition/Results: The desired future condition resulting from this action would, in the short-term, be a stand that had 40-50% canopy cover. Reduction of the canopy to this level would result in reduced competition on retained trees. Growth rates of the remaining trees would be maintained or would increase. Mortality of remaining conifers and hardwoods would decrease. There would be a hardwood component within the stand for a longer period of time. In the long-term, stand vigor would be maintained. Crowns of existing trees would become fuller and canopy cover would increase from post harvest levels. Eventually canopy cover would return to near pretreatment levels. However, instead consisting of numerous smaller trees, the canopy would be formed from the crowns of fewer but larger trees. The stand would contain scattered large hardwoods.

Prevention/Avoidance Strategies: Treatment that reduced stand density and canopy cover would help to keep hardwoods and shrubs within the stand where they currently are and would allow them to develop in areas where gaps in the canopy were created.

Recommended Treatment: A commercial density management (CDM) treatment that thins from below is the recommended treatment for **unit 18-2**. Mark to retain 40-50% canopy cover across the unit. Unlike prescriptions designed to increase or accelerate the growth of trees for wood volume, trees of a variety of conditions such as those containing decay, trees that have numerous and large branches, and trees with broken tops or past snow damage are to be retained in addition to trees that would be retained in a "traditional" commercial thin. Retain trees twenty inches and larger dbh. Where possible mark so that a variety of spacing of residuals will result. Mark so that small openings (canopy gaps) are created. This may involve marking two-three adjacent trees. Thin and harvest cut stems to one hundred twenty five (125) feet of streams. Cable yard with one end suspension. Thin the no harvest areas and areas of non-commercial

conifers to twenty-five (25) feet of streams on a 16'x16' to 18'x18' spacing retaining some trees that would be felled as snags. Remove ponderosa pine unless tree is dominant and able to remain in the stand for the long-term. Retain hardwoods. Evaluate for need to treat fuels. Slash brush, handpile and burn piles as appropriate.

Silvicultural Options Considered: A treatment that reduce canopy cover to 30-40% was considered but was rejected because of soils and water quality concerns.

UNIT 18-3
T.32S., R.3W., section 18

Stand Description: Unit 18-3 is a young stand that has resulted from a past timber harvest. The unit was clearcut in 1962 as Snow Creek #1. Following harvest the unit was planted. Portions of Unit 18-3 were precommercially thinned on a 13' x 13 spacing and were aerially fertilized. The southern portion of the unit consists of primarily Douglas-fir 8-12" dbh mixed with smaller Douglas-fir 1-8" dbh mixed with limited amounts of hemlock. Smaller Douglas-fir are generally spindly. Hardwoods consist of areas of chinquapin and madrone. Rhododendron and salal are present. The northern portion of the unit is similar only dominant Douglas-fir are smaller, generally in the 6-8" dbh. Live crown ratios on the dominant conifers is generally around 40%. Hardwoods are dying out of the stand.

Analysis: This area is designated Late Successional Reserve. Objectives for this land use allocation are focused on late successional habitat and the wildlife that it supports. Existing conifers are capable of responding to a treatment that reduces competition from adjacent vegetation. While precommercial thinning has taken place within the unit, those treatments were designed primarily to produce wood volume. The current stand development trajectory will result in a loss of desired late successional stand characteristics such as: long crowns; large diameter branches; a mix of conifers, hardwoods, and shrubs; and canopy gaps. Treatment at this time would help to maintain hardwood and shrub species in the unit. Access for cable yarding, size of material that could be removed and cost of helicopter yarding make economical removal of merchantable material questionable.

Desired Future Condition/Results: The desired future condition resulting from this action would be a stand that had stand densities reduced. Reduction of densities would result in reduced competition on retained trees. Growth rates of the remaining trees would be maintained or would increase. Mortality of remaining conifers and hardwoods would decrease. There would be a hardwood component within the stand for a longer period of time. In the long-term, stand vigor would be maintained. Crowns of existing trees would become fuller and canopy cover would increase from post harvest levels. Eventually canopy cover would return to near pretreatment levels. However, instead consisting of numerous smaller trees, the canopy would be formed from the crowns of fewer but larger trees. Large hardwoods would be part of the stand.

Prevention/Avoidance Strategies: Enlarging growing space through a density management treatment while trees are capable of responding will allow more rapid growth to occur and will result in a quicker attainment of a forest stand with characteristics of older forests. Timely treatment will prevent growth from slowing and hardwoods from dying out of the stand by being overtopped. Timely treatment will also help to maintain stand stability by creating conditions where tree diameter growth rates are enough to support the weight of the tree.

Recommended Treatment: A **non-commercial density management (NDNM) treatment** is recommended for **unit 18-3**. Space conifers seven inches and less on a variable spacing (crown space) so that there is 4-8 feet between crowns of residual trees. Retain hardwoods. On stump

sprouted hardwoods treat so as to retain only one or two main stems. Evaluate for need to treat fuels. Slash brush, handpile and burn piles as appropriate.

Silvicultural Options Considered: A commercial density management treatment was proposed for Unit 18-3 but was rejected due to access, size of material to be removed and cost of yarding

UNIT 19S-1
T.32S., R.3W., section 19
T.32S., R.4W., section 24

Stand Description: Unit 19S-1 is a young stand that has resulted from past timber harvests. The area between the roads in the southern part of the unit received an overstory removal harvest treatment in 1980. Follow-up maintenance treatments have been done for conifers regeneration in this area. The remainder of the north aspect was cut in 1968 and 1969 as a Cedar Springs unit and as a select cut. The area was planted, precommercially thinned on a 12'x12' spacing and aerially fertilized. This area now contains Douglas-fir that are 12-14" dbh near the road and 6-10" dbh downslope. The area is brushy. Rhododendron, salal, red huckleberry, Pacific yew and chinquapin are present. Live crown ratios are 40-60%. The remainder of Unit 19S-1 (south aspect) was clearcut in 1983 as Late Snow #8. This area was planted after a site preparation treatment. A release treatment has been done. This area is predominantly Douglas-fir 2-4" dbh with limited white fir and hemlock. Average spacing appears to be about 10'x10'. Shrub species present include rhododendron, oceanspray, red huckleberry, slick leaf ceanothus, and salal.

Analysis: This area is designated Late Successional Reserve. Objectives for this land use allocation are focused on late successional habitat and the wildlife that it supports. Existing conifers are capable of responding to a treatment that reduces competition from adjacent vegetation. While precommercial thinning has taken place within the unit, those treatments were designed primarily to produce wood volume. The current stand development trajectory will result in a loss of desired late successional stand characteristics such as: long crowns; large diameter branches; a mix of conifers, hardwoods, and shrubs; and canopy gaps. Treatment at this time would help to maintain hardwood and shrub species in the unit. While portions of the unit could receive a commercial density management treatment, size and amount of material that could be removed and move in costs make economical removal of merchantable material questionable.

Desired Future Condition/Results: The desired future condition resulting from this action would be a stand that had stand densities reduced. Reduction of densities would result in reduced competition on retained trees. Growth rates of the remaining trees would be maintained or would increase. Mortality of remaining conifers and hardwoods would decrease. There would be a hardwood component within the stand for a longer period of time. In the long-term, stand vigor would be maintained. Crowns of existing trees would become fuller and canopy cover would increase from post harvest levels. Eventually canopy cover would return to near pretreatment levels. However, instead consisting of numerous smaller trees, the canopy would be formed from the crowns of fewer but larger trees. Large hardwoods would be part of the stand.

Prevention/Avoidance Strategies: Enlarging growing space through a density management treatment while trees are capable of responding will allow more rapid growth to occur and will result in a quicker attainment of a forest stand with characteristics of older forests. Timely

treatment will prevent growth from slowing and hardwoods from dying out of the stand by being overtopped. Timely treatment will also help to maintain stand stability by creating conditions where tree diameter growth rates are enough to support the weight of the tree.

Recommended Treatment: A non-commercial density management (NDNM) treatment is recommended for **unit 19S-1**. Space conifers seven inches and less on a variable spacing (crown space) so that there is 4-8 feet between crowns of residual trees. Retain hardwoods. On stump sprouted hardwoods treat so as to retain only one or two main stems. Evaluate for need to treat fuels. Slash brush, handpile and burn piles as appropriate.

Silvicultural Options Considered: A commercial density management treatment was proposed for part of Unit 19S-1 but was rejected due to cost of yarding and value of material to be removed

UNIT 30-1a
T.32S., R.3W., section 30

Stand Description: Unit 30-1a is a two-storied stand. The overstory consists of Douglas-fir generally 24-36" dbh mixed with areas of slightly smaller incense cedar. The understory consists of patches of Douglas-fir and incense cedar regeneration mixed with oceanspray and limited numbers of madrones. Soils are serpentine influenced with areas of rock.

Analysis: This area is designated Matrix. Portions of the stand meet RMP criteria for regeneration harvest (overstory removal-OR). Regeneration present is capable of responding to the release provided by an OR.

Desired Future Condition/Results: The desired future condition resulting from this action would be a stand that had two distinct canopy layers. The upper canopy layer would consist of a mixture of mature Douglas-fir and incense cedar. Trees within this layer would provide larger structural elements such as future snags and larger coarse woody debris. Canopy cover would be light, as approximately nine large conifers per acre would remain. The understory canopy layer would consist of existing Douglas-fir and incense cedar regeneration and regeneration that became established within a few years following harvest, treatment of activity fuels, and site preparation. The two-storied stand would continue into the long-term. There would be 3-5 larger hardwoods per acre.

Prevention/Avoidance Strategies: Timely site preparation, removal of slash from existing seedlings, and reforestation following harvest would allow conifer seedlings the benefit of occupying the site before competitive species such as ocean spray and madrone.

Recommended Treatment: Modified Even-aged Silvicultural System with stand regeneration through an Overstory Removal (OR) is recommended for unit 30-1a. Harvest merchantable conifers greater than six inches dbh. Emphasize retention of existing conifer regeneration. Retain 7 conifers across the range of diameters over 20" dbh per acre. Retained conifers should approximate species composition of the present stand and should be dispersed throughout the unit. Retained conifers should consist of both sound and cull trees. Retain two additional conifers per acre for future coarse woody debris. Retain 3-5 larger hardwoods per acre where present. Helicopter yard. Evaluate stocking levels after harvest. Space existing established regeneration at a spacing of 14'x14' where clumpy. Handpile slash and burn piles. If necessary for unit to meet stocking standards, plant with a mixture of 75% Douglas fir and 25% minor species predominantly rust resistant sugar pine. Conduct follow-up maintenance/ protection treatments through stand establishment. Follow-up treatments may include treatments such as handpiling and burning of piles to reduce activity fuels.

Silvicultural Options Considered: No harvest of this area is proposed under Alternative 3.

UNIT 30-1b
T.32S., R.3W., section 30

Stand Description: Unit 30-1b is predominantly a single-storied stand consisting of pole size Douglas-fir 10-16" dbh. Downslope areas contain greater numbers of poles, occasional larger Douglas-fir and patches of advanced regeneration.

Analysis: This area is designated Matrix. While portions of the stand may meet RMP criteria for regeneration harvest the majority of the stand does not. Conifers present are capable of responding to a thinning. Conifers are large enough to be commercial.

Desired Future Condition/Results: The desired future condition resulting from this action would, in the short-term, be a stand that had approximately 40% canopy cover retained across the unit. Reduction of the canopy to this level would result in reduced competition on retained trees. Growth rates of remaining trees would be maintained or would increase. Mortality of remaining conifers would decrease. As understory vegetation developed under canopy gaps the stand would be two-storied. In the long-term, stand vigor would be maintained. Larger conifers would remain in the stand and would be in sound condition at the time thinned trees met criteria for regeneration harvest. Crowns of existing trees would become fuller and overall canopy cover would increase from post harvest levels. Eventually canopy cover would return to near pretreatment levels. However, instead consisting of numerous smaller trees, the canopy would be formed from the crowns of fewer but larger trees. The unit would retain or develop (where disturbance created canopy gaps and there was no understory canopy layer) into a two-storied stand. There would be Douglas fir over limited amounts of brush and ground cover. In areas there would be patches of young conifers. The stand would contain 3-5 larger hardwoods per acre.

Prevention/Avoidance Strategies: Maintenance of canopy cover and subsequent treatments such as fertilization to increase this canopy cover and density would slow/prevent the establishment and growth of competitive vegetation.

Recommended Treatment: Commercial thinning (CT) is the recommended treatment for unit 30-1b. The thinning should be from below with the emphasis on maintaining a minimum canopy cover of 40% across the unit. Space codominant and dominant trees where they are clumped. Throughout the unit, retain larger conifers unless they show signs of mortality within 2-3 years. Retain snags. Helicopter yard. Evaluate stocking levels after harvest. Space non-commercial conifers on a 14'x14' spacing. Handpile slash and burn piles.

Silvicultural Options Considered: No harvest of this area is proposed under Alternative 3.

UNITS 30-1c
T.32S., R.3W., sections 30, 31

Stand Description: Unit 30-1c is a mixed unit that contains a variety of different stand types. The area is heavily influence by serpentine soils. Portions of the unit are influenced by granitic soils. The northeastern part of the unit is cooler and wetter than the southwestern portion. The northwestern portion of the unit contains areas that are two-storied and as well as areas that have three canopy layers. The overstory consists of large Douglas- fir that are 20-52” dbh mixed with occasional incense cedar and ponderosa pine. Overstory trees exhibit some signs of age and decadence. There are trees with dead tops, trees with thinning tops, and trees with flat tops. Conk is present in some trees. The middle canopy, where present, consists of a mix of Douglas-fir poles, advanced Douglas-fir regeneration, and chinquapin. The understory consists of Douglas-fir and incense cedar regeneration mixed with rhododendron, salal, and chinquapin. Portions of the area have been partial cut in the past.

The southwestern part of the unit can be divided into three general areas. Approximately two-thirds of the area has had some kind of harvest in the past. The southern portion was selectively cut. Overstory conifers in this area consist primarily of large incense cedar and ponderosa pine with limited numbers of Douglas-fir. Diameters generally range from 28-40”dbh. This area contains areas of pole size Douglas-fir 12-20”dbh as well as advanced Douglas-fir, ponderosa pine, and incense cedar regeneration. Shrub and hardwood species include madrone, canyon live oak, manzanita, ceanothus, and oceanspray. The western aspect along road 32-3-32 has also been harvested. The northern and upslope portions of this area received an overstory removal harvest. The area consists of patches of Douglas-fir poles mixed with Douglas-fir regeneration, oceanspray, and madrone. Much of the area has been precommercially thinned. The remainder of the area is largely unentered containing large Douglas-fir, incense cedar and pine over conifer regeneration and shrubs. Rock outcroppings and low-site, withdrawn lands can be found near the ridge.

Analysis: This area is designated Matrix. Portions of the unit have been previously harvested. These areas generally do not have enough merchantable trees in them at the present time to support another harvest entry. These areas tend to be those with access to roads. Areas that contain suitable numbers of large trees would require road construction of helicopter yarding to harvest. A portion of the unit was precommercially thinned in 2001. Much of the conifer regeneration in the understory would respond to a treatment that released selected individuals. Much of the unit is along a ridge. Fuels buildup has been identified as a concern. There have been few fuels treatments in the general area.

Desired Future Condition/Results: The desired future condition resulting from this action would be to maintain the health and presence of an overstory of large diameter conifers where it exists and to allow existing smaller conifers within the stand to reach a merchantable size. The unit would continue to be a mixture of different stand types. Reduction of the competing vegetation within the unit would result in reduced competition on retained trees. Growth rates of the remaining trees would be maintained or would increase. Mortality of retained conifers and

hardwoods would decrease. Live and dead fuels within the unit would be decrease. Fuel ladders would be decreased.

In the long-term, stand vigor would be maintained. Larger conifers would remain in the stand. Crowns of existing trees would become fuller and overall canopy cover would increase from post harvest levels. Eventually canopy cover would return to near pretreatment levels. However, instead consisting of numerous smaller trees, the canopy would be formed from the crowns of fewer but larger trees. Unit would be managed and harvested as described by current management plan.

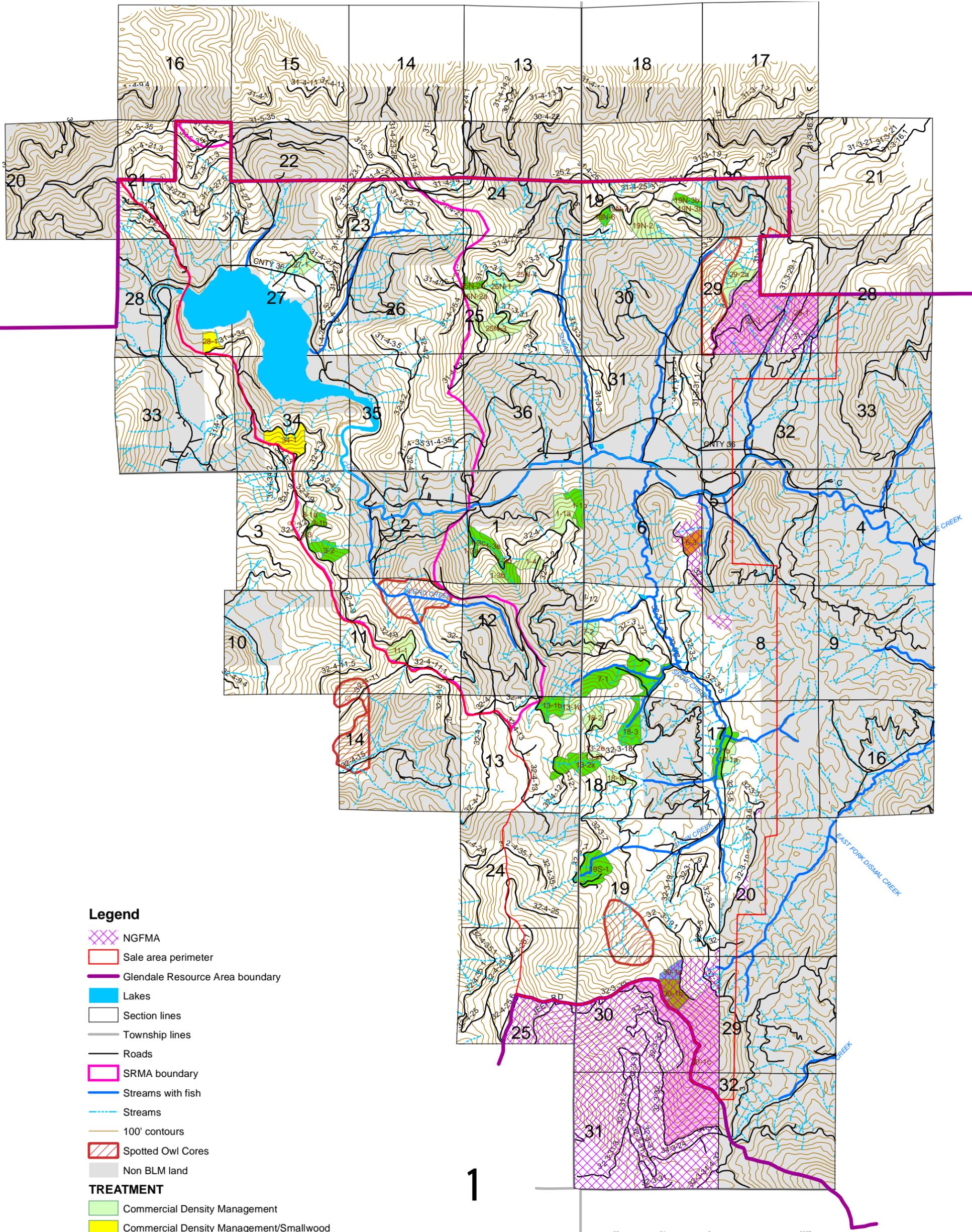
Prevention/Avoidance Strategies: Treatments that maintained or increased stand vigor and growth would reduce the time young conifer stands are most vulnerable to wildfire. Treatments that allowed canopy cover to recover while reducing ladder fuels would reduce stand vulnerability to wildfire. These treatments would also slow/prevent the establishment and growth of competitive vegetation.

Recommended Treatment: A **non-commercial density management /fuels (NDNM/Fuels)** treatment is recommended for unit 30-1c. Within areas of the unit that have not been precommercially thinned reduce stand density (stocking levels of conifers, hardwoods, and shrubs) by thinning understory vegetation seven inches and less in diameter so that conifers are retained on a 16'x16' spacing and hardwoods are retained on an overlapping 40'x40' spacing. Treatment should be a thinning from below with the emphasis on retaining vigorous, well-formed conifers and hardwoods. Where possible, preference for retention should be given to site adapted pine and oak species. Prune leave trees to reduce ladder fuels. Slash brush, handpile slash and burn piles. Within the portion of the unit that has been precommercially thinned, retain existing conifers. Space hardwoods on an overlapping 40'x40' spacing. Slash brush, handpile newly created and older slash, and burn piles. Evaluate unit after treatment to determine if there are areas within the unit that do not meet current stocking standards. Plant if areas exist. Evaluate for fuels build-up 3-5 years after harvest. Do follow-up fuels treatments such as slashing/handpiling/ burning piles or underburning (where it does not conflict with objectives of the land use allocation) as needed to slow development of ladder fuels. Seed with a mixture of native forage plants if seed is available.

Silvicultural Options Considered: None.

Appendix 4 - Maps

Proposed Slim Jim Treatment Units - Alt 2



Legend

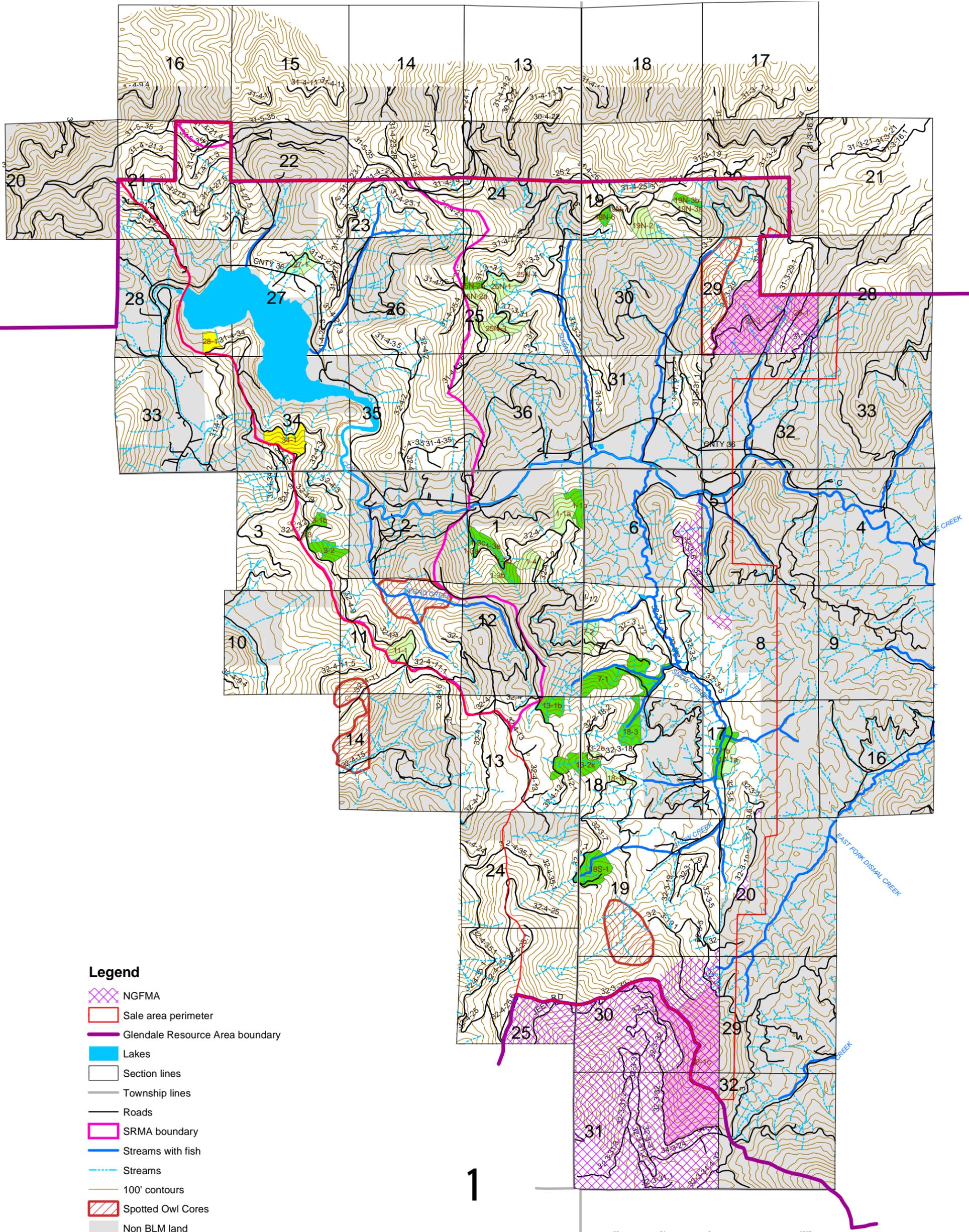
- NGFMA
- Sale area perimeter
- Glendale Resource Area boundary
- Lakes
- Section lines
- Township lines
- Roads
- SRMA boundary
- Streams with fish
- Streams
- 100' contours
- Spotted Owl Cores
- Non BLM land

TREATMENT

- Commercial Density Management
- Commercial Density Management/Smallwood
- Commercial Thinning
- Non-Commercial Density Management
- Non-Commercial Density Management/Fuels
- Overstory Removal
- Regeneration Harvest

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Proposed Slim Jim Treatment Units - Alt 3



Legend

- NGFMA
- Sale area perimeter
- Glendale Resource Area boundary
- Lakes
- Section lines
- Township lines
- Roads
- SRMA boundary
- Streams with fish
- Streams
- 100' contours
- Spotted Owl Cores
- Non BLM land

TREATMENT

- Commercial Density Management
- Commercial Density Management/Smallwood
- Non-Commercial Density Management
- Non-Commercial Density Management/Fuels

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