Environmental Assessment
And
Finding of No Significant Impact

Willy Slide Timber Sale

EA Number OR118-05-006
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United States Department of the Interior
Bureau of Land Management
Medford District
Glendale Resource Area
Douglas County, Oregon

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Abstract:
The Glendale Resource Area, Medford District, Bureau of Land Management (BLM) proposes to harvest timber on federal lands within the West Fork Cow Creek watershed. The Planning Area is located in Township (T) 31S, Range (R) 9W, Sections 7-11, 14-23, 26-35; T 32S, R 9W, Sections 3-10, 16; T 31S, R10W, Sections 13, 24, 25 and T 32S, R 10W, Section 1.

This environmental assessment discloses the predicted environmental effects of two alternatives: Alternative 1 (No Action) and Alternative 2 (Proposed Action). The Proposed Action includes harvesting timber on approximately 197 acres of forest land by regeneration, group selection, overstory removal, selection cut and commercial thinning silvicultural treatments. Harvesting methods include tractor, high lead cable and heliciopter yarding systems. Regeneration harvest units would be planted if necessary to ensure adequate stocking. Piling and burning of created harvest residue (slash) would be conducted to reduce fire hazard and prepare the site for planting of conifer seedlings. Harvesting and associated forest management activities are planned to occur between 2005 until 2011.

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FINDING OF NO SIGNIFICANT IMPACT

Based upon review of the EA (Environmental Assessment #OR-118-05-06) and supporting project record, I have determined that Alternative 2 (Proposed Action) is not a major federal action and would not significantly affect the quality of the human environment, individually or cumulatively with other actions in the general area. No environmental effects meet the definition of significance in context or intensity as defined in 40 CFR 1508.27. Therefore, an environmental impact statement is not needed. This finding is based on the following discussion:

Context. The Proposed Action is a site-specific action directly involving approximately 197 acres of BLM (Bureau of Land Management) administered land that by itself does not have international, national, region-wide, or state-wide importance. The Proposed Action is located within the matrix land use allocation and within the Gold Mountain sub-watershed which is part of the larger 5th field West Fork Cow Creek Watershed, a Tier 1 Key Watershed.

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 Proposed Action. 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 Proposed Action, most noteworthy, include: **1)** social and economic benefits by providing a sustainable supply of timber and other forest commodities to provide jobs and contribute to community stability **2)** provide early-successional habitat for elk; **3)** fuels reduction treatments on 197 acres is a very small portion of the fifth-field watershed (0.35 percent) and the cumulative effect of increasing the fire risk is minimal; **4)** activities that are proposed under this alternative would cause soil displacement, compaction and loss of productivity. Harvesting would result in compaction on about 4% of cable harvest units, 1% of helicopter-logged units, 12% of tractor logging units. Compaction would result on about 0.0015 % of the Planning Area with temporary road construction. These levels are within RMP/EIS guidelines of 12% (pp. 4-12-13); **5)** slight potential of sediment input to streams along proposed haul routes would "not likely to adversely effect" Oregon coast coho salmon (Letter of concurrence, October 2004); **6)** modification of 197 acres of spotted owl habitat by removing approximately 27 acres of suitable habitat, downgrading 9 acres of suitable to dispersal habitat, degrading 151 acres of dispersal habitat and removing 10 acres of dispersal habitat. The U.S. Fish and Wildlife Service (USFWS) compared the proposed action with

other actions within the watershed, and found the loss of suitable habitat to be reasonably well distributed (USDI/USFWS 2003, p. 7) and would not preclude spotted owl movement across the watershed; 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 (sensitive, assessment). 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 Proposed Action is comparable to other timber harvest projects which have occurred within the Glendale Resource Area 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, park lands, prime farm lands, wetlands, wild and scenic rivers or wildernesses located within the project area.

4. **The degree to which the effects on the quality of the human environment are likely to be highly controversial.** The effects of the Proposed Action 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 Proposed Action is 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 Proposed Action does not set a precedent for future actions that may have significant effects nor does it represent a decision in principle about future consideration. The Proposed Action would occur within the matrix land allocation which emphasizes timber harvesting. 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 Proposed Action 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 Proposed Action 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 Proposed Action 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 Proposed Action would result in the potential for disturbance to northern spotted owls. The Proposed Action would remove 27 acres of suitable habitat, downgrade 9 acres of suitable habitat, modify 151 acres of spotted owl dispersal habitat (these acres would still be in a condition to function as dispersal habitat post harvest) and remove 10 acres of dispersal habitat. The Willy Slide Timber Sale was 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).

   The Proposed Action is not expected to have any adverse effects to Oregon Coast coho salmon. In accordance with regulations pursuant to Section 7 of the Endangered Species Act of 1973, as amended, informal consultation with NOAA Fisheries was completed in October 2004 with a "not likely to adversely affect" determination.

10. **Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.** The Proposed Action does not violate any known federal, state, or local law or requirement imposed for the protection of the environment. Furthermore, the Proposed Action is 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 includes harvesting timber on approximately 197 acres of forest land by regeneration, group selection, overstory removal, selection cut and commercial thinning silvicultural harvest treatments. Harvesting methods include conventional tractor and high lead cable yarding systems and the more intensive helicopter yarding system. Regeneration harvest units would be planted if necessary to ensure adequate stocking as required by the Federal Land Policy and Management Act (FLPMA). Piling and burning of created harvest residue (slash) would be conducted to reduce fire hazard and prepare the site for planting of conifer seedlings. It is estimated that 19.5 miles of existing roads would be renovated and 1.5 miles of temporary roads would be built and decommissioned after use. A replacement gate would be installed on road 31-9-26 that would reduce vehicle access to approximately 6 miles of roads. Harvesting and associated forest management activities are planned to occur between 2005 until 2011.

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 matrix and riparian reserve under the *Medford District Record of Decision and Resource Management Plan (*RMP, 1995).

1.2 Project Location

The Planning Area is approximately 18 miles northwest of the town of Glendale and is delineated by the Gold Mountain HUC 6 (Hydrologic Unit Code) sub-watershed boundary. The Planning Area encompasses approximately 16,000 acres in a checkerboard pattern of public and private ownerships and is within the larger 55,842 acre West Fork Cow Creek fifth-field watershed. The West Fork Cow Creek watershed is listed as a Tier 1 Key Watershed under the Northwest Forest Plan (NFP). Elevations within the Planning Area range from 1,600 feet along West Fork Cow Creek in section 27 to nearly 3,000 feet in section 23. Average annual precipitation is 60-90 inches. Existing unpaved roads accessing the Planning Area would be analyzed for effects and are within the Elk Valley HUC 6 sub-watershed.

1.3 Background

An environmental assessment (EA, OR118-04-015) for the Willy Slide Project was made available for public review in July, 2004 and two comment letters were received. Since the time of publicizing the EA, all BLM timber sales in Oregon have been under review due to litigation. The interdisciplinary team reviewed the original Willy Slide Project Environmental Assessment for consistency. Based upon a review with agency direction and NEPA (National Environmental Policy Act) adequacy a decision was made by the Glendale Field Manager to prepare a new environmental assessment (OR 118-05-006).

1.4 Purpose and Need for the Proposal

1.4.1 Need for Action

The Medford Resource Management Plan (RMP) states the primary purposes of managing BLM-administered lands are the need for forest habitat and "forest products that will help maintain the stability of local and regional economies, and contribute valuable resources to the national economy on a predictable and long term basis" (p. 3). The RMP identifies land management objectives based on a series of Land Use Allocations (LUA). Included in the allocations is the matrix land allocation. One of the primary objectives for managing matrix lands is to provide for a sustainable supply of commercial timber, consistent with other objectives. The Medford District RMP also recognizes the Oregon and California Revested Lands Sustained Yield Management Act (O & C Act) which requires the Secretary of the Interior to manage O & C lands for permanent forest production in accord with sustained yield principles (RMP, p.17).

1.4.2 Purpose for Action

The purpose of the Proposed Action is to meet the need of implementing the Medford RMP through harvesting timber. The Medford RMP identified a minimum age for regeneration harvesting at 100 years (RMP, p. 74). Regeneration harvests are even-aged silvicultural systems that "create new-even-aged stands through harvesting while retaining both living and dead structural elements" (RMP, p. 180). Commercial thinning is a silvicultural system generally applied to younger commercial size stands to "control stand density, maintain stand vigor, and place or maintain stands on developmental paths so that desired stand characteristics result in the future" while providing an entry that is economical (RMP, p.85).

Project objectives include:

1. "Produce a sustainable supply of timber and other forest commodities to provide jobs and contribute to community stability" (RMP, p. 38)

2. "Provide early-successional habitat" (RMP, p. 39).

1.5 Plan Conformance

This Proposed Action tiers to and conforms to the *Final-Medford District Proposed Resource Management Plan/Environmental Impact Statement* and *Record of Decision* (EIS, 1994 and RMP/ROD, 1995).

The Proposed Action also is in conformance 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 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 term "tiering" refers to the coverage of general matters in broader environmental impact statements, as those listed above.

Parts of the *West Fork Cow Creek Watershed Analysis* are incorporated by reference. Watershed analysis is an analytical process and not a decision-making process as provided in the Record of Decision for the Northwest Forest Plan (p. B-20).

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 Decisions to be Made

The Glendale Field Manager is the official responsible for deciding whether or not to prepare an environmental impact statement, and whether to approve the project as proposed, not at all, or to some other extent.

Chapter 2.0 Alternatives

2.1 Introduction

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

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) of harvesting timber and implementing the Medford RMP at this time. Harvest would, however, occur at another location under separate NEPA analysis in order to meet harvest commitments identified in the RMP (pp. 3, 17). Selection of this alternative would not constitute a decision to reallocate these lands to non-commodity uses. Future harvesting in this area would not be precluded and could be analyzed under a subsequent EA. Road maintenance would be dependant on funding and reciprocal road use agreements. There would be no gating or improvement of roads to reduce road related and elk management related impacts.

2.2.2 Alternative 2 (Proposed Action)

The Proposed Action would meet the purpose and need objectives stated in Chapter 1 of producing a sustainable supply of timber and other forest commodities to provide jobs and contribute to community stability (RMP, p. 38) and providing early-successional habitat (RMP, p. 39).

Approximately 197 acres would be harvested by: regeneration (52 acres- includes regeneration, overstory removal and group select), selection cut (6 acres), and commercial thin (139 acres). Approximately 33 acres would be yarded with tractor, 140 acres by cable and 24 acres by helicopter. The 197 acres harvested would be treated for fuels by the slash/hand pile/burn and

underburn methods. Treatments include manual methods in combination with prescribed burning. 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. The Field Manager will determine whether changes would be made to better meet fuels objectives if planned fuels treatments require specific adjustments. It is estimated that 19.5 miles of existing roads would be renovated (brought back to original condition) and approximately 1.5 miles of temporary roads would be built and then decommissioned. A replacement gate would be installed on road 31-9-26 that would reduce vehicle access to approximately 6 miles of roads. No permanent road construction would occur under this alternative.

All units, except commercial thinning, would be evaluated for reforestation needs. Burning would be done to prepare the site for planting, control competing vegetation, and reduce fire hazard. Planting would be done as necessary to meet desired stocking levels. Additional treatments, such as shade-carding, mulching, providing browse protection and controlling competing vegetation could be implemented to ensure adequate establishment of the next forest stand.

Table 2-1 provides a listing of specific harvest unit treatments, Table 2-2 provides a listing of treatments for existing roads and Table 2-3 provides a list of temporary road construction.

Table 2 – 1. Unit Treatments

Unit Number	**Alternative 2** Proposed Action
11-1	Group Select (within 15 acre unit boundary) Cable, 4 ac
15-2	Commercial Thin / Group Select (9 - 1ac openings) Cable 96 ac.
17-1a	Group Select (Within 17 acre unit boundary) Helicopter, 3 ac
17-1b	Commercial Thin (2 – 1 ac openings) Helicopter, 11 ac
23-1	Overstory Removal Helicopter, 10 ac Tractor, 6 ac
23-2	Selection Cut Cable, 6 ac

Unit Number	Alternative 2 Proposed Action
23-4	Commercial Thin Tractor, 4 ac Cable, 6 ac
27-2b	Commercial Thin/Regeneration Harvest Cable, 4 ac
27-3b	Overstory Removal/Commercial Thin Cable, 5 ac
27-3c	Overstory Removal Cable, 1ac
27-4	Overstory Removal Tractor, 2 ac Cable 1 ac
27-6	Group Select Tractor, 5 ac
33-1	Commercial Thin (60% retain) Cable, 17 ac. Tractor, 16 ac.

Table 2 - 2. Management of Existing Roads (Proposed Action)

Road Number	Road Name	Length (mi)	Surface Type	Proposed Action
31-8-31 F,G	Elk Valley Road	1.24	ABC	Renovation
31-9-10.B	Panther Ridge	0.60	NAT	Renovation/Improvement
31-9-11 A	Upper Six Mile Ridge	0.88	ABC	Renovation
31-9-11.3		0.15	NAT	Renovation
31-9-11.4		0.43	NAT	Renovation
31-9-20 A		0.65	NAT	Renovation
31-9-21 A,B	Gold Mountain Spur	1.48	PRR	Renovation
31-9-21.4 A,B	Tie - Rd	0.40	NAT	Renovation
31-9-22 A,C,D1,D3.	Gold Mountain Road	2.93	PRR	Renovation

Road Number	Road Name	Length (mi)	Surface Type	Proposed Action
31-9-22 B		0.36	PRR	Renovation
31-9-22 D2		0.04	GRR	Renovation
31-9-23	Panther Ridge Mainline	0.58	PRR	Renovation
31-9-23.6	Ridge Top Fork	0.30	NAT	Renovation
31-9-25.1 B,D	Upper Panther Creek	3.33	NAT	Renovation
31-9-25.1 A,C,E		1.32	NAT	Renovation
31-9-26 A,B	Panther Peak	1.31	PRR	Renovation, Gate
31-9-27 A,B		1.37	ASC	Renovation
31-9-27.1A,B,C	Panther Creek Sale Road	1.05	NAT	Renovation/Improvement
31-9-27.4		0.10	NAT	Renovation
32-8-1.1D1		0.95	ASC	Renovation
Total Miles		**19.47**		

Renovation is bringing the road back to its original state (ie. brushing, culvert replacement, blading and shaping).

Note: Road miles include BLM and non-BLM roads.

ASC: aggregate surface course
GRR: grid rolled rock
PRRr: pit run rock
NAT: native surface
ABC: aggregate base course
BST: bituminous surface treatment

Table 2 - 3. Temporary Road Construction (Proposed Action)

Access to Unit	Road type	Length, mi.	Control	Surface Type
Unit 11-1	2 spurs	0.18	BLM	NAT
Unit 15-2	2 spurs	0.64	BLM	NAT
Unit 23-4	2 spurs	0.20	BLM	NAT
Unit 27-3	1 spur	0.06	BLM	NAT
Unit 33-1	3 spurs	0.41	BLM	NAT
Total miles		**1.49**	***BLM***	

2.2.2.1 Harvest Methods

See Silvicultural Prescriptions for specific harvest unit descriptions (Appendix 4). The intent in regeneration harvest (RH) units and overstory removal (OR) units are to regenerate a new stand of conifers while retaining a component of snags, down wood, hardwoods, and overstory legacy trees. In general, RH and OR prescriptions would harvest timber, leaving at least 7-10 large conifers per acre. These conifer trees would be selected proportional to the existing species composition and equally across all 20"+ diameter classes present. The RMP specifies retaining 6-8 green conifer trees per acre (RMP, p. 39). One to two trees per acre would be retained to ensure meeting coarse woody debris guidelines (USDA/USDI. 1994b, p. C-40). In addition, two large hardwood trees per acre would be retained (where available) as well as snags and down logs. The RH units would be burned, if necessary, to prepare the site and then planted. In the OR units, the intent is to protect and release existing young conifer reproduction, with possible inter-planting, rather than relying solely on planting, as in RH units. Where needed, OR units would be hand-piled and burned as necessary to reduce fuels and prepare the site for planting.

In the units proposed for selection cut (SC), individual trees would be removed from the stand to provide increased growing space for residual large trees and established regeneration, and to retain overstory shade for planted seedlings and encourage natural regeneration of conifers. In the units proposed for SC, 10 to 25 trees per acre would be retained in the overstory. Selection cut harvest units would be underburned as necessary under cool conditions in order to protect the retention trees.

In group selection (GS) units, small patch cuts would create openings of approximately one acre in size. The intent of the GS harvests is to create openings to provide for elk forage yet small enough that late-successional conditions are maintained over the stand as a whole, and introduce forest stand structure diversity within large older stands. These interspersed openings would create small sized early seral vegetation areas offering security within mid-seral and late-successional habitat areas, providing forage for elk, and habitat for early-successional wildlife species. The GS openings would be hand-piled and burned to reduce fuels and prepare the site for planting and seeded for elk forage. Snags and large down wood would be retained as in RH and OR treatments.

In commercial thin (CT) units, merchantable trees from an even-aged stand would be removed to encourage the growth of the residual trees. Stands are generally composed of younger commercial sized trees.

2.2.2.2 Quarries

Rock, if needed, would be obtained from the following quarries:

Wilson Head	Sec. 1, Twn. 32S., Rng. 9W.
#A & B	Sec. 17, Twn. 31S., Rng. 8W.
#C	Sec. 19, Twn. 31S., Rng. 8W.
#D	Sec. 2, Twn. 32S., Rng. 9W.
#E & F	Sec. 33, Twn. 31S., Rng. 9W.
#G	Sec. 25, Twn. 31S., Rng. 9W.
#H	Sec. 28, Twn. 31S., Rng. 9W.
#I	Sec. 24, Twn. 31S., Rng. 9W.
#J	Sec. 14, Twn. 31S., Rng. 9W.

Quarry "C" is in a riparian reserve. However, rock has been extracted recently from this quarry; little to no vegetation is present within the quarry. Quarry "F" has not been used recently and is partly re-vegetated. The east half of this quarry is in a riparian reserve. Only the west half of this quarry would be used. None of the other quarries are located within a riparian reserve. Quarry "J" is on private land and it is unknown whether it is located within a riparian area. In addition, quarries "H" and "I" are on private land. Some blasting may be necessary in these quarry locations.

Table 2-4 summarizes specific harvest features measured in acres and miles for transportation management work for the Proposed Action. The accompanying map, located in Appendix 5 of this document, provides a geographic display of the harvest and road prescriptions.

Table 2 - 4. Harvest System Summary

	Alt.1 – No Action	**Alt. 2** Proposed Action
Number of units	---	14
Acres of RH	---	4
Acres of OR	---	25
Acres of SC	---	6
Acres of GS	---	23
Acres of CT	---	139
Total harvest acres	**---**	**197**
Acres of cable		140
Acres of tractor		33
Acres of helicopter		24

	Alt.1 – No Action	**Alt. 2** Proposed Action
Roads		
renovate (mi.)	---	19.5
new temp (mi)	---	1.49

RH = Regeneration Harvest GS = Group Selection Harvest CT = Commercial Thinning
OR = Overstory Removal SC = Selection Cut

2.3 Project Design Features

Project Design Features (PDFs) are specific measures included in the design of the Proposed Action 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 Streams and Riparian Zones

Riparian reserves have been established along all streams or water bodies in accordance with the Medford District ROD/RMP (pp. 26, 27). Reserve widths are 160 feet (one site potential tree height as determined for this area) on each side of non fish-bearing streams. There would be a 100 foot no disturbance buffer around wet areas (springs and seeps) if found during project implementation. A riparian reserve of 320 feet wide (two site potential tree heights) would be established on each side of a fish-bearing stream (West Fork Cow Creek). All riparian reserve widths and other protection buffer widths are slope distance. No unstable ground is adjacent to harvest units.

Active landslides would be avoided in harvesting timber and road construction. No yarding would occur through riparian reserves.

2.3.2 Roads

Temporary spur roads and landings built would be fully 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.

Temporary roads and helicopter landings would be winterized with water bars, berms, dikes, dams, sediment basins, gravel, or mulched as needed. The term “winterize” means to minimize the amount of erosion which takes place before the disturbed soil and new surfaces are stabilized.

New temporary road construction, decommissioning, road renovation, road improvement, and log hauling would be allowed between May 15 and October 15 of the same calendar year. Renovation would consist of roadside brushing, reshaping and restoring the surface where necessary, maintaining or improving drainage structures and applying rock surfacing where needed. If the roads are deemed too wet: log haul would be suspended during wet weather if it generates visible turbidity into stream channels. The Field Manager may approve a provisional off-season log hauling agreement, for example if dry weather 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.

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.

Excavated material would be end-hauled to designated locations, where necessary, to maintain site productivity, reduce ravel potential, or where side-casting would adversely affect riparian areas.

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, 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. 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.

Helicopter landings located on private lands would comply with road use agreements and all applicable state and federal environmental laws, regulations and standards.

Helicopter landing sites, other than those identified in this EA, would be approved by the Field Manager and would meet state and federal regulations.

Hydraulic fluid and fuel lines on heavy mechanized equipment would be in proper working condition in order to minimize potential for leakage into streams.

Cleaning culvert inlets in stream channels would be restricted to between July 1 and September 15 in accordance with Oregon Department of Fish and Wildlife (ODFW) instream work period guidelines.

2.3.3 Yarding of Timber

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 would be allowed if approved by the Field Manager. Water bar spacing on tractor skid trails would be based on existing guidelines considering slope and soil series.

Unit layout would restrict tractor yarding to slopes less than 35% in order to prevent excessive soil disturbance. In order to minimize soil disturbance, tractor blades would not be used to excavate tractor trails.

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

Tractor yarding would use existing skid roads if present. New skid roads would be pre-designated and approved by the Authorized Officer.

Skid roads used in this timber sale would be discontinuously sub-soiled with winged rippers and water-barred to reduce erosion. This work would be allowed between May 15 and October 15. Water bars would be installed at the same time as sub-soiling. Native grass/forb seeding, mulching or hay bale placement would be done where needed to minimize surface erosion.

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.

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 in all units to protect residual leave trees and existing conifer regeneration.

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

2.3.4 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/USDA 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. Surveys would be conducted to determine if there are owls in unoccupied suitable habitat within ¼ mile of units.

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, prescribed fire, blasting) would not be permitted within specified distances (see Table 2-5) or up to 0.25 miles, at the discretion of the action agency biologist, 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. This distance may be shortened if significant topographical breaks or blast blankets (or other devices) muffle sound traveling between the blast and nest sites.

Broadcast burning (for site preparation) would not take place within 0.25 mile of known active northern spotted owl nests between March 1 and 30 June (or until two weeks after the fledging period) without concurrence from the Level 1 consultation team.

Table 2 - 5. Seasonal Restrictions for Spotted Owls

Type of Activity – for Spotted Owl	Zone of Restricted Operation
Blast of more than 2 pounds of explosive	1 mile
Blast of 2 pounds or less of explosive	360 feet
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

2.3.5 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 the site.

2.3.6 Vegetation

Prior to initial move-in and all subsequent move-ins, heavy equipment would be washed before moving into the Planning Area to remove soil and plant parts that could spread invasive and noxious weeds.

2.3.7 Fuel Conditions

Prescribed burning within the harvest units 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. Underburning and broadcast burning would typically be done from fall through late spring. 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 burning areas from reburning or becoming an escaped fire. Specific adjustments to planned fuels treatments would require Field Manager approval.

Landing piles would be burned, if necessary, on all harvest units.

2.3.8 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.

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; fish, streams, riparian habitat and soils** as the result of management activity.

The Environmental Effects portion of this chapter provides the analytical basis for the comparisons of the alternatives (40 CFR§ 1502.16) and the reasonably foreseeable environmental consequences to the human environment that each alternative would have on the relevant resources. Impacts can be beneficial, neutral or detrimental. This analysis considers the direct impacts (effects caused by the action and occurring at the same place and time), indirect impacts (effects caused by the action but occurring later in time and farther removed in distance but are reasonably foreseeable) and cumulative impacts (effects caused by the action when added to other past, present and reasonably foreseeable future actions). The temporal and spatial scales used in this analysis may vary depending on the resource being affected.

When encountering a gap in information, the question implicit in the Council on Environmental Quality regulations on incomplete and unavailable information was posed: Is this information "essential to a reasoned choice among the alternatives?" (40 CFR 1502.22[a]). While additional information would often add precision to estimates or better specify a relationship, the basic data and central relationships are sufficiently well established that any new information would not likely reverse or nullify understood relationships. Although new information would be welcome, no missing information was determined as essential for the decision maker to make a reasoned choice among the alternatives.

3.2 Fire Risk

3.2.1 Affected Environment

Fire risk is the probability of when a fire would occur within a given area. Historical records show that lightning and human caused fires are common in the Planning Area. Activities within this area such as dispersed camp sites, recreational use, and major travel corridors add to the risk

component for the possibility of a fire occurring from human causes. The timeframe most conducive for fires to occur is from July through September.

Information from the Oregon Department of Forestry database from 1967 to 2003 showed a total of 38 fires occurred throughout the West Fork Cow Creek watershed and burned a total of 425 acres. Lightning accounted for 61 percent of the total fires and human caused fires accounted for 39 percent.

The following table (**Table 3-1**) is a break down of the fires within the watershed:

Table 3 - 1. Wildfires within the West Fork Cow Creek

Total Number of Fires	**Size Class**
23	A (<.25ac)
12	B (.26-10ac)
2	C (10.1-100ac)
0	D (100.1-300ac)
1	E (300.1-1000ac)

The class E fire was 365 acres in size and was human caused. The two class C fires were 13 and 15, acres in size. One of these fires was human caused and the other by equipment.

3.2.2 Environmental Effects

3.2.2.1 Alternative 1 (No Action)

The average return interval for low-severity fire regime stands would increase because without thinning treatments prescribed fire cannot be safely re-introduced in the Planning Area. Younger trees (mostly conifers) contribute to stress and mortality of mature conifers and hardwoods.

The current trend of increasing stand density which results in increased mortality to the timbered stands would continue. Ladder, surface fuels and aerial fuels (crown density) would also increase within these stands. Increasing stand densities and fuel loadings would increase the chance of more acres that would burn in high intensity fires within the Planning Area. As fire is continually excluded and stand densities continue to increase, the risk for higher proportions of high severity fire effects increase.

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. In the immediate future, the area would continue to have more years with below normal precipitation. While specific information is not available within the Planning Area, the trend over the past 5 years (2000-2004) has been below average precipitation in Oregon. Current and reasonably foreseeable events and actions would increase fire effects to the extent that droughty weather occurs. Therefore, larger and more intense fire behavior would likely occur until a large proportion of the Planning Area has burned.

3.2.2.2 Alternative 2 (Proposed Action)

Future underburns in thinning units, 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. The season in which underburning is implemented is based on achieving hazard reduction objectives while minimizing impacts to the site. Fall or spring underburning is utilized when fuel loadings are low enough to allow for a low intensity burn similar to that which was historically common in these fire regimes.

The Proposed Action would reduce the overall density (aerial fuels), ladder fuels and surface fuels of units proposed for harvest. This would affect fire behavior by reducing flame length, fire duration and the amount of acres burned.

It is anticipated that fuel loadings after logging would be increased by approximately 3-15 tons to the 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 6 months to a year) there would also be an increase in the duration and intensity of a ground fire should it occur. This would cause increased mortality to the smaller diameter overstory trees. However, despite the temporary increase in ground fuels, recent research indicates that a reduction in crown fuels outweighs any increase in surface fire hazard (Omi and Martinson). This temporary increase in surface fuels is usually less than one year. This is also the time period to implement the fuel treatments to dispose of the surface and ladder fuels in these stands. Surface fuels would be treated on all the acres harvested.

The 52 acres of regeneration harvest (RH, GS, OR) would in the short-term (7-10 years) be more fire resilient, but after the stand is re-established with small trees it would have an increased fire risk (increase in flammability) until the stand develops into an older age class (stands approximately greater than 80 years of age).

Fuels reduction treatments would occur on 197 acres (all proposed Willy Slide harvesting units) along with approximately 400 acres under the Bear Pen and Mr. Wilson timber sales within the West Fork Cow Creek Watershed. These treatments of fuels are expected to be completed

within 1-2 years. Since this is a very small portion of the fifth-field watershed (1.1 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 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 land 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/USDI 2003 BO, p.103). 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.

Three known spotted owl sites (Cow Elk, Gold Mountain and Wall Walker) are within 0.7 miles of proposed harvest units. One hundred-acre core areas have been designated for Cow Elk, Gold Mountain and Wall Walker owl sites. Recent surveys in Knee Deep and Wall Walker owl sites indicate that these two sites have been alternately used by the same owls, and that Knee Deep is not an independent site. Cow Elk has been known to utilize other alternate nesting areas. One known barred owl site is in the 5th field watershed, but there are no known sites within the Planning Area. Not all owl sites are visited to protocol every year (USDI/USDA 2003, p. 72 and Table 3-2).

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 (Table 3-1) have contributed to a total of approximately 23% (satellite imagery change detection data) of the Gold Mountain 6th field sub-watershed being converted to unsuitable spotted owl habitat. Other sub-watersheds within the West Fork Cow Creek watershed ranged from 10%- 23% openings (1974-2002 change detection data). Table 3-2 shows visit effort and owl status determination for 2000-2004.

Table 3 - 2. Northern Spotted Owl Visit Effort and Status Determination for 2000-2004.

Owl Site	2000	2001	2002	2003	2004
Cow Elk (100 acre core)	Pair Nested Reproduction unknown	Pair Nested 1 Juvenile	1 visit No response	1 visit No response	Pair Nested
Gold Mountain	No response	No response	1 visit No response	Not monitored	Not monitored
Wall Walker (100ac core)/Knee Deep*	No response	Pair Nested 1 Juvenile	Female	Not monitored	Nesting pair

* These sites have been alternately used by the same owls

3.3.1.2 Environmental Effects

Alternative 1 (No Action)

The No Action Alternative would have little impact on late-successional forest and old-growth forest associated species in the Planning Area at this time. If 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 under future actions for harvesting. It would not likely support additional productive owl sites. 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).

The lack of fuels treatments would increase the risk of stand replacement fire within the Planning Area (see section 2.2.2.1). Catastrophic loss of vegetation would threaten late-successionally affiliated species which depend on these forest habitats for survival, reproduction, and dispersal.

Alternative 2 (Proposed Action)

All the proposed harvest units contain suitable habitat or dispersal habitat and are assumed to be used by adjacent resident owls, or by dispersing owls. The configuration of habitat used by individual owl sites is unknown, but areas of habitat used during breeding season are usually smaller and increase during fall and winter (Forsman et. al.). The USFWS uses a 0.7 mile radius to delineate an area most heavily used during the nesting season (USDI 2003, BO p. 21). The USFWS recommends discretionary agency conservation measures to further minimize the impacts to spotted owls, including deferring loss or degradation of suitable owl habitat within 0.7 miles of known owl sites (BO p.109). Commercial thinning units 15-2 and 33-1 are the only

units adjacent to owl sites, and are functioning as dispersal habitat, providing some foraging and roosting opportunities (Table 3 - 3)

Table 3 - 3. 100 Acre Core NSO Sites within 0.7 miles of Harvest Units

Spotted Owl Sites	Willy Slide units affecting owl sites within approximately 0.7 miles
Cow Elk (100 ac. core)	15-2 (Commercial thin)
Gold Mountain (100 ac. core)	none
Wall Walker (100 ac. Core)	33-1 (Commercial thin)

Most private land has been intensively harvested, much of it in the last few decades (Satellite change detection data 1974-2002). Remaining nesting habitat on private is not expected in the future to be suitable habitat.

Under the Proposed Action units 11-1, 17-1a, 17-1b, 27-2b, 27-3b, 27-3c, 27-4 and 27-6 would remove approximately 27 acres of suitable habitat by RH, GS, OR, downgrade 9 acres from suitable to dispersal habitat by CT (unit 17-1b). Units 15-2, 23-1, 23-2, 23-4 and 33-1 would degrade approximately 151 acres of dispersal habitat by commercial thinning but maintain dispersal habitat. Dispersal habitat includes maintaining 40% canopy and a minimum average stand diameter of 11" diameter at breast height (DBH) (USDA/USDI 2003 BA p. 42). Ten acres of dispersal habitat would be removed by 1 acre group selection in unit 15-2. 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 effect of the harvesting would be to reduce owl productivity 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 would expand home range size to compensate for habitat loss and degradation (Meiman pp. 1254-126).

The harvest of 27 acres of late-successional suitable owl habitat through regeneration harvesting (RH, GS, OR) would result in a loss of nesting habitat available for alternate nesting sites, reduced prey availability for adults and young, and loss of habitat available for dispersing owls. However, these stands would provide woodrat habitat 5-10 years (Carey et. al.) for foraging owls along the edges of regeneration harvested units and would develop into dispersal habitat in approximately 30 years.

The 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 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 watershed and found the loss of suitable habitat to be reasonably well distributed (USDA/USDI 2003, BO p. 71) and would not preclude spotted owl movement across the watershed. The Proposed Action would result in a "take" of suitable northern spotted owl habitat (USDA/USDI 2003 p. F-2).

The Cow-Upper watershed baseline suitable habitat is 30,924 acres. The cumulative removal of 27 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. 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 4).

3.3.2 Northern Spotted Owl Critical Habitat

3.3.2.1 Affected Environment

Unit 33-1 is within Critical Habitat Unit OR-67. The stand was thinned in 1994 and canopy cover exceeds 60%. The 2003 baseline nesting roosting foraging (NRF) acres within CHU OR-67 are reported as 49,612 acres (USDA/USDI 2003 BO, p. 80).

Critical Habitat Unit OR-67 provides a portion of the link from the Klamath Mountains Province to the southern end of the Oregon Coast Ranges Province. It helps support the western end of the Rogue-Umpqua portion of the Interstate-5 Area of Concern which connects the southwest edge of the Oregon Cascades Province to the Klamath Mountains Province (USDI/USDA 2003 BA, Appendix B-4). While no target amounts of NRF were identified for critical habitat, the current baseline for all CHU's in SW Oregon Administrative Units is 450,568 acres (USDA/USDI 2003 BO, pp. 62-63).

3.3.2.2 Environmental Effects

Alternative 1 (No Action)

The habitat in unit 33-1 is currently functioning as dispersal habitat and would continue to develop into older forest without harvesting. In 20-30 years it might develop into suitable owl habitat and provide inconsistent nesting opportunity. However, this unit is in matrix land and would be managed in the future to meet matrix forest management objectives for timber harvest. Dispersal habitat is to provide connectivity between late-successional reserves, and provide habitat for a variety of organisms associated with both late-successional and younger forests (USDA/USDI 1994a, p. B-43).

Cumulative impacts from fire, disease, private harvesting, road development, fuels treatments, are expected to remove and degrade habitat in CHU OR-67. The role of nesting, roosting, foraging, and dispersal habitat would continue to function as intended, providing a supporting link between the Coast Range and Cascade/Klamath Provinces, and allowing genetic interchange. The CHU would also continue to be supported with the overlaying Fish Hook/Galice LSR, riparian reserves, and adjacent matrix land.

Alternative 2 (Proposed Action)

Unit 33-1 falls within Critical Habitat Unit OR-67. The unit lacks late-successional habitat structure for nesting. Unit 33-1 would commercially thin 33 acres to 60% canopy cover. Habitat would be degraded, but continue to function as dispersal quality habitat, also providing a reduced level of roosting and foraging opportunities for 1-2 years, as undergrowth responds to increased light levels. The canopy reduction would last for 10-20 years. The removal of suppressed or defective trees would degrade the effectiveness of the habitat to develop into suitable owl habitat. Retaining 60% canopy and minimum stand diameter of 11" DBH would retain high level of constituent elements for dispersal habitat in CHU-OR-67.

Cumulative impacts from fire, disease, private harvesting, road development, fuels treatments, are expected to remove and degrade habitat in CHU OR-67. Biological Opinion (USDA/USDI 2003) evaluated proposed activities and summarized that CHU would continue to function at the landscape scale. SW Oregon Administrative Units that comprise the CHU system in the Rogue and South Coast Basins would continue to provide high quality habitat for spotted owls within the action area and the function this CHU system to provide habitat would not be precluded by the Proposed Action (p. 104).

3.3.3 Fisher (Bureau Sensitive, Federal Candidate)

3.3.3.1 Affected Environment

The USFWS 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 the 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. High intensity fires from fuels build up (see section 3.2) could also have contributed to the loss of habitat. Habitat loss may have extirpated breeding fishers from the Planning Area. Dispersal of fishers is thought to be restricted by large rivers and wide highways. There are no known sightings in the Glendale Resource Area. The nearest known sightings, from three incidental visual observations (2002-2004), are approximately 20 miles southeast. This indicates that suitable habitat could occur in the adjacent LSR and solid block ownership and that fisher could occupy or be dispersing through the resource area, including the West Fork Cow Creek watershed.

Remote camera surveys were conducted to protocol (Zielinski) in 2003-2005 and incidental road observations from BLM personnel have failed to detect this species in the West Fork Cow Creek watershed. There have not been confirmed detections in any of the 5th field watersheds within the Glendale Resource Area.

Approximately 16,300 acres of the 27,100 acres of BLM administered lands, within the 55,800 acre West Fork Cow Creek watershed are considered to be late-successional forest (USDI 1997). Recent BLM sales removed approximately 400 acres of late-successional forest (ie. Mr. Wilson and Bear Pen Timber sales), reducing late-successional habitat to approximately 15,900 acres on BLM land.

3.3.3.2 Environmental Effects

Alternative 1 (No Action)

The West Fork Cow Creek watershed would continue to provide habitat poorly suited for fishers due to landscape fragmentation as a result of checkerboard ownership, continued harvesting and stand age rotation of 60 years on private lands (RMP/EIS, p.4-5), past federal harvest, low quantity of large blocks of late-successional forest on BLM, low densities of large snags and down wood on BLM land harvested prior to the NFP, and high road densities.

Harvest would occur at another location under separate NEPA analysis in order to meet harvest commitments identified in the RMP (pp. 3, 17). Selection of this alternative would not constitute a decision to reallocate these lands to non-commodity uses. Future harvesting in this area would not be precluded and could be analyzed under a subsequent EA.

Alternative 2 (Proposed Action)

The Proposed Action would remove approximately 27 acres of late-successional forest from OR, RH and GS units. Approximately 170 acres of dispersal habitat in CT, OR and SC units would be degraded and retain approximately 30-40% canopy, providing reduced protection and foraging until the understory responds to increased light levels. Large snags and down wood retained in OR/RH/SC/GS areas would be less suitable for denning until covered with regrowth (30-40 years).

Powell and Zielinski generalized an average home range for fishers as 40 and 15 km^2 for males and females respectively. The gender, possible den site locations of the observed fishers, is unknown and home range of fishers within the Klamath Province is not well documented, so an accurate determination of effects to the fisher is unable to be determined.

Due to the small size and isolation of late-successional forest units from previous harvesting on BLM matrix and private lands within the West Fork Cow Creek watershed, it is possible that it may no longer be suitable for resident fishers. The largest late-successional blocks are expected to continue be restricted to LSRs. The fisher was analyzed in the NFP and failed to pass the species viability screens due to its dependence on interior forest habitat and large, down woody debris. With the cumulative effects of private harvesting, low BLM ownership and few large patches of BLM late-successional habitat at low elevations, the fishers natural rareness, slow re-colonization rates of restored habitats, the species is not expected to be well distributed throughout its range (USDA/USDI 1994a, pp. 53, 470). This project would not change the assessment predicted in the NFP, and the impacts from the Proposed Action are expected to be minor.

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 fuels treatments. Harvesting small group selection units, smaller fragmented stands, deferring larger late-successional blocks of habitat, increasing large retention trees from 6-8 to 7-10 trees per acre, and recent surveys already conducted to locate fisher populations (with no detections), would minimize the impact to this species (USDA/USDI 1994a, p. 470).

3.4 Streams/ Riparian Habitat/Fish

3.4.1 Affected Environment

Primary drainages within the Planning Area include West Fork Cow Creek and several of its seventh-field tributaries: Panther Creek, Walker Creek and Gold Mountain Creek. The West Fork Cow Creek Watershed is listed as a Tier 1 Key Watershed under the Northwest Forest Plan (NFP). Based on field observations, forest conditions on both ownerships have been altered by timber harvest over the last 40 to 50 years, particularly on private lands.

Within the Planning Area the BLM manages 46% and 61% of all acres within the mixed ownership Gold Mountain and Elk Valley 6th field watersheds. The use of roads within the Elk Valley Creek 6th field was considered and NOAA Fisheries issued a letter of concurrence that actions "will not likely to adversely affect" Oregon coast coho salmon. About 9% of all acres in the Gold Mountain 6th field watershed have been compacted by tractor logging and road construction. Soil compaction reduces soil productivity and vegetation growth rate by decreasing soil porosity and increasing density, which in turn reduces moisture infiltration rate and potentially increase surface runoff. There are 127 miles of roads in the 16,394 acre Gold Mountain Creek 6th field watershed, about 5 miles per square mile.

Much of the recent timber harvest activity on private and BLM lands (Table 3-5) has been within the transient snow zone, which comprises about 40% of the Planning Area (Gold Mountain 6th field watershed). The transient snow zone is generally considered lands above 2,500 feet in elevation. Watersheds with open forest canopy in the transient snow zone are more susceptible to accelerated runoff and higher peak flows from rain-on-snow events than similar sized watersheds at lower elevation where precipitation usually falls as rain, rather than snow. Watershed acres less than 30 years of age (generally due to wildfire or timber harvest) as well as road density and stream channel condition, are used to evaluate the risk for rain-on-snow events. The effects might cause streambank erosion and subsequently degrade habitat for salmonids and other aquatic species.

The Medford Change Detection Program (interpretation of satellite imagery) allowed for analysis of forest canopy disturbances during the period from 1974 to 2002. The acres provide were computer generated using imagery interpretation and acreages are only estimates. Most vegetation within the Planning Area is functioning within its hydrologic potential since 74% is at least 28 years of age (Table 3 - 4). Vegetation is considered to be in an advanced stage of hydrologic recovery 20 years after disturbance and substantially complete by age 30 (Harr 1989; Adams and Ringer 1994). However, when numerous other factors are considered (i.e. water quality, stream habitat, channel condition, flow characteristics and other watershed features), the 6th field watershed is functioning below potential (potential-at-risk), primarily because of past and current human activity (Appendix 3).

In considering changes to vegetation within the past 30 years, 23% (3,807 acres) of all lands in the 16,394 acre Gold Mountain HUC 6 have been logged or burned to various extents since 1974 (Table 3-5). Of these 3,807 disturbed acres, 35% (1,338 acres) are more than 18 years of age. All acres that have been disturbed since 1974 are in various stages of regrowth and hydrologic recovery. Logging activity, mainly on private lands, has been increasing recently within the Panther Creek and Gold Mountain Creek drainages (see Table 3-5).

Table 3 - 4. Vegetation Condition in the Gold Mountain 6th field watershed

Total acres In the Gold Mountain 6th field watershed	% BLM	**Minimum** % of all acres in the 6th field watershed that are in hydrologic recovered condition, based on appearance of new openings in the forest canopy between 1974 and 2002 (28 years) (acres)	Acres in the transient snow zone (TSZ) (% TSZ of all 6th field watershed acres)	**Minimum** % of all acres in the TSZ that are in hydrologic recovered condition in 2002, based on appearance of new openings in the forest canopy between 1974 and 2002 (28 years) (acres)
16,394	47	12,090 (74%)	6607 (40%)	77% (5104)

(*) Landsat remote sensing technology was used to determine the percentage of the Gold Mountain 6th field where openings in the forest canopy appeared (minimum resolution= 1.1 acres) between 1974 and 2002, **28 years**. Acreages are estimates based on satellite imagery. Most acreage where openings did not appear during this time period is assumed to be largely or in fully functioning hydrologic condition since vegetation is in an advanced stage of hydrologic recovery after 20 years and substantially complete by age 30 (Harr 1989; Adams and Ringer 1994). The exception to this assumption is land in non-forest - agricultural and rural residential land, roads, rock quarries, rock outcrops, etc. that has been in this condition for decades and most likely would not change for the foreseeable future. Open, compacted acres due to road construction represents approximately 2% of total acreage in the Action Area. Openings that appeared between 1974 and 2002 are in various stages of hydrologic recovery. Therefore, estimated percent of acres in proper hydrologic functioning condition in columns 3 and 5 of this table are **minimums**. Percentage of acreage in non-forest openings is included in the pre- and post-harvest calculations.

Table 3 - 5. Vegetation Disturbance (Gold Mountain 6th field watershed)

Disturbance Period			
Year of comparison satellite photography	Years since disturbance	Gold Mountain Creek HUC6 acres disturbed	% of acres disturbed between 1974 and 2002
1974-1984	18 to 28	1338	35
1984-1989	13 to 18	337	9
1989-1995	7 to 13	1277	33
1995-1999	3 to 9	567	15
1999-2002	0 to 3	288	8
Totals		3807 *	100

*Open acres also includes another 179 acres of rock outcroppings, rock quarries, natural meadows, etc. and 318 acres of roads, for a total of 4,304 acres (26% of the 6th field watershed), leaving at least 74% of the watershed in proper hydrologic functioning condition. Acreages are estimates based on satellite imagery.

3.4.1.1 Stream Habitat/Riparian Zones/Fish

The West Fork Cow Creek HUC 5 watershed is an integral part of the Aquatic Conservation Strategy. Key Watersheds are areas identified as being crucial for recovery of "at-risk" stocks of anadromous and resident fish species. These refugia include areas of good as well as degraded habitat. Areas in good condition are intended to serve as anchors for the potential recovery of depressed fish stocks.

There are 160 miles of perennial and intermittent streams in the Gold Mountain 6th field watershed and 119 miles in the Elk Valley Creek 6th field watershed, where only log haul on existing roads would be affected. Most harvest units are located in the 7th field sub-watersheds of Gold Mountain, Panther and Walker Creek (fish-bearing streams); however, a few units are in small frontal drainages that border West Fork Cow Creek.

There are about 22 miles of fish-bearing streams in the Planning Area (Table 3-6). West Fork Cow Creek, Gold Mountain Creek, Panther Creek, Wallace and Walker Creek provide habitat for Oregon Coast coho salmon (proposed ESA – listed Threatened), OC steelhead (ESA – candidate).

Table 3 - 6. Estimated miles of fish habitat in the Willy Slide Planning Area.

Stream Name	Miles of Fish Habitat
West Fork Cow	6.6
Gold Mountain	5.6
Panther	4.4
Walker	4.8
Wallace	1.0

Most of the streams in the Planning Area are functioning at less than optimum condition (Table 3-7 and Appendix 3), a situation that began in the 1950s with the advent of accelerated timber harvest and associated intensive forest management activities. Road construction and timber harvest has led to accelerated stream sedimentation, increases in water temperature, loss of large wood in stream channels and creation of migration barriers at road/stream crossings. Road building and timber harvest on many streams has removed mature conifers that would otherwise would have contributed to pool formation and complexity and played a major role in routing of sediment, gravels and organic materials from headwaters to the mouth.

Culverts block or impede movement of aquatic animals, such as fish and amphibians, where they constrict channel width (increase water velocity), have "falls" at the outlet or do not contain adequate amounts of streambed substrate. Although several barriers to salmon and steelhead migration have been replaced in recent years through watershed restoration funding, there are still many culverts that block or impede passage of cutthroat trout and amphibians on other streams (USDI 1997). This situation may have implications for long-term survival and genetic diversity.

Un-maintained or poorly maintained roads contribute sediment to streams, reducing habitat suitability for fish, amphibians and other aquatic vertebrate and invertebrate species. High road density may have altered the timing of peak flows following storms. Tractor logging, done mostly on private lands, has always been the most economical method of removing logs from harvest units, but also causes the most soil compaction and has the highest risk for soil erosion and stream sedimentation, especially when conducted during the wet season. Although more haul roads on private lands are rocked now than they used to be, they are still serious sources of stream sediment when used for winter log haul. Most BLM roads are rocked; natural surface roads on BLM are only used for log hauling during the dry season. Tractor logging on BLM is allowed between May15 and October 15. While logging on all ownerships is more environmentally sensitive today than it was 50 years ago (e.g. less tractor logging on steep slopes, more rocked roads and more water-barred tractor skid roads), it still can contribute sediment to streams (Table 3-7).

Table 3 - 7. Baseline Condition of Key Elements of Fish-bearing Streams in the Willy Slide Timber Sale Planning Area.

Habitat Element	Function	Current Condition	Properly Functioning Condition
Riparian Reserves	Essential for water temperature control and the source of large wood for: pool formation and complexity, side channels in low gradient channels; routing of sediment, organic material and gravel; refuge for fish and amphibians from predators and high water velocity. Condition on BLM lands influences stream conditions on private lands (and vice versa).	Riparian reserve quality: Poor. Only about 36% of BLM riparian reserves are more than 80 years of age, the stage at which late-successional characteristics begin to appear. (West Fork Cow Creek WA). Riparian habitat quality across all ownerships: Although data is unavailable, the percentage of riparian habitat in proper functioning condition is probably considerably less than 30%. Virtually no large down wood (ODFW 1995, 1996).	Riparian reserves provide adequate shade, future large wood, habitat protection and connectivity for sensitive aquatic species. Little or no evidence of salvage; sufficient down wood or within range of expected conditions (Klamath Province/ Siskiyou Mountains Matrix of Pathway Indicators) At least 80% intact.
Streambed Sediment	Small amounts of sediment in montane streams of this region are essential for production of some species of aquatic insects and fish. Stream substrate with low sand, silt and clay contributes to a diverse aquatic insect community (major food source for amphibians and fish) and has a minimal negative effect on survival of amphibians and salmonids.	Moderate to high substrate embeddedness, based on aquatic macroinvertebrate sampling (Aquatic Biology Associates 1993, 1997, 2001).	<20% fines in gravel; little cobble embeddedness (Klamath Province /Siskiyou Mountains Matrix of Pathway Indicators)
Stream Channel Stability	When within range for site potential (e.g. geology, soil type, and channel type), it contributes to optimal hydrologic functioning and interaction with riparian zone.	W:D ratio is within the range for these B and C channel types (ODFW 1995). Streambank stability: 1% are unstable (ODFW 1995).	Width: depth ratio for specific channel types are within the natural range and site potential. W:D ratio: Between 12 and 30 for B and C type channels (ODFW 1995). Streambank stability: little evidence of eroding banks or within range of expected conditions (Klamath/Siskiyou Mountains Matrix of Pathway Indicators)

3.4.1.2 Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), in concordance with the Sustainable Fisheries Act of 1996 (Public Law 104-267) designated Essential Fish Habitat (EFH) for Oregon coast coho and chinook salmon. Only coho salmon is found within the Planning Area. The MSA defined EFH as "...those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (Federal Register, Vol. 67, No. 12)." Most of the streams in the Planning Area are functioning at less than optimum condition (Table 3-7 and Appendix 3).

Table 3 - 8. Estimated miles of Essential Fish Habitat (Magnuson-Stevens Act)

Stream Name	Miles of EFH for coho salmon
West Fork Cow Creek	6.6
Gold Mountain Creek	1.5
Panther Creek	1.2
Walker Creek	1.1
Wallace Creek	0.3

3.4.2 Environmental Effects

Alternative 1 (No Action)

No roads would be built or decommissioned. Some roads left un-maintained would continue to erode and contribute sediment to streams, including habitat for Oregon Coast coho salmon, a proposed "threatened" species. Without road renovation there would be no short-term addition of sediment to streams. However, the beneficial long-term effects of reducing stream sedimentation by improving road drainage would not occur under this alternative. The net effect would be to allow the present levels of erosion and stream sedimentation to continue and increase over time, an overall adverse effect on streams and fish habitat.

Timber harvest and log hauling would continue on private commercial forest lands. Given the checkerboard ownership pattern of private and federal lands in the watershed, habitat suitability for aquatic species would remain in fair to poor condition (i.e. functioning at risk). Harvest would occur at another location under separate NEPA analysis in order to meet harvest commitments identified in the RMP (pp. 3, 17). Selection of this alternative would not constitute a decision to reallocate these lands to non-commodity uses. Future harvesting in this area would not be precluded and could be analyzed under a subsequent EA.

Riparian Habitat - Selecting the No Action Alternative would not forego opportunities for riparian restoration activities because none are proposed under the Action Alternative. Riparian condition would be maintained and reach properly functioning condition over time.

Stream Habitat Connectivity - Stream habitat connectivity would continue to function below potential because no stream culverts would be replaced.

Stream Sediment - There would be no short-term addition of sediment to streams from road renovation. Other roads on BLM and private lands in the watershed would continue to contribute sediment to streams if not adequately maintained. The present levels of erosion and stream sedimentation on BLM lands within the Planning Area would continue and would increase over time, an overall adverse effect on streams and fish, including habitat for Oregon Coast coho salmon, a proposed "threatened" species and OC steelhead trout (ESA Candidate).

Stream Channel Stability - This habitat factor would be maintained under the No Action Alternative, since any peak flow increases under the Action Alternative would be highly unlikely and immeasurable.

Essential Fish Habitat - Habitat for Oregon coast coho would continue to function below potential under this alternative.

Alternative 2 (Proposed Action)

None of the key stream habitat factors (Table 3-7) would be degraded in the long term in the Gold Mountain and Elk Valley Creek 6th field watersheds.

Riparian Habitat - Riparian habitat quality, (including stream shade, water temperature and sources of large down wood) would be maintained in the short and long term because there would be no harvest, yarding corridors, log landings, site preparation or road construction in riparian reserves. There are no proposed harvest units within one site potential tree height of West Fork Cow Creek, so shade removal is not an issue under this Proposed Action. Removing rock from Quarry C (Section 2.2.2.2) would not reduce stream shade or remove sources of large down wood because rock has been extracted intermittently since 1976, leaving the area largely devoid of vegetation.

Habitat Connectivity - Stream habitat connectivity would be maintained to correct condition because no stream culverts would be added, replaced or removed.

Stream Sediment - Although tree felling, log yarding, prescribed burning, construction of temporary roads and rock quarry operations are ground-disturbing activities, they would contribute little, if any, soil to streams. Soil that moves on cable yarding corridors during storm events would be trapped by logging slash or by ground cover on undisturbed ground at the

bottom of yarding corridors. Tractor yarding and road building would be restricted to the dry season (May 15 to October 15) when there is low potential for runoff from compacted ground. Sub-soiling skid trails and temporary roads under dry soil conditions would shatter soil compaction by as much as 80% (Davis, pp. 138. 139), substantially increasing water infiltration during storm events. None of the tractor skid roads and temporary haul roads would contribute sediment to streams because they are located on or near ridges several hundred yards from any stream. Most soil that leaves cable yarding corridors and enters road ditchlines would be routed through crossdrain culverts onto vegetated, uncompacted forest soils. Riparian reserves 160 feet wide would effectively prevent any loose soil, generated by log yarding and pile burning, from reaching streams because they have substantial depth of duff-litter and vegetative ground cover. Literature indicates that buffer strips of 30 meters (98 feet) or greater prevent adverse sedimentation effects from logging on salmonid eggs and alevins development (Moring, pp. 295-298) and are adequate to maintain macroinvertebrate diversity at pre-harvest levels (Belt, pp. 11). Log landings would be mulched and seeded after proper drainage has been established in order to prevent soil movement. Streambank stability would be maintained because there would be no yarding across streams.

Removing rock from Quarry C (Section 2.2.2.2), which is in a riparian reserve, would not contribute to stream sediment because operations would be restricted to the dry season. Rock quarry operations would be restricted between may 15 and October 15 to minimize potential for sediment movement to streams.

It is likely that road renovation and log hauling would contribute sediment to streams but it would be immeasurable more than several hundred feet downstream of road crossings. Any soil that enters stream channels would be initially stored in small headwater streams behind abundant woody debris in 1st, 2nd and 3rd order streams and be released over time during storm events, becoming indistinguishable from baseline conditions. Although there may be small, negative effects on amphibians and other aquatic species within several hundred feet of road crossings, any sediment that reaches fish habitat would be undetectable and have no measurable effect on survival, food supply or on quality of spawning and rearing habitat, primarily because appropriate PDFs would be used to minimize the amount of soil that these activities contribute to streams. For instance, blading road prisms, including ditchlines, and cleaning culvert inlets would be limited to where absolutely necessary to maintain proper drainage and to limit the amount of soil disturbance. (Note: blading ditchlines typically involves removing only obstructions to flow [e.g. such as soil and rock from road cutslope failures and dense growth of vegetation that is forcing water onto the road prism).

A study by Luce and Black (pp. 2561-2570) showed substantial reductions (about 80 percent) in sediment delivery to roads in the Oregon Coast Range where well-vegetated or armored (covered with rock fragments) ditch lines of rocked roads were left ungraded. Log haul and road renovation would be limited to dry road conditions, regardless of whether a road is rocked or natural surface. Hauling would be suspended any time of year when water is flowing from the road surface to ditchlines that connect to streams. Many road-stream crossings in the Planning

Area are typically dry during summer and therefore provide no mechanism for delivering sediment to streams at the time of year when habitat quantity and quality is most limiting for aquatic species. Most fines that are generated by log hauling during the standard May 15 to October 15 log haul season, as well as loose soil that is generated by blading priority segments of ditchlines, would be routed through crossdrain culverts onto uncompacted, vegetated ground. Sediment that is not captured by crossdrain culverts, as well as soil that is disturbed during culvert inlet cleanout would be mobilized during the first major storm event of the wet season and become an insignificant portion of background sediment levels several hundred feet downstream of the road crossing. Because the miles of haul road and the harvest units are spread across several townships, log truck traffic (along with associated rock wear) would not be concentrated on just a few roads (leading to accelerated rock wear) until they reach valley bottoms where roads nearest critical habitat are paved (West Fork Cow Creek).

Although there would be a slight, short term increase in sediment input to streams from road renovation, the activity would have potential beneficial effects on fish, amphibians and other aquatic species in the longterm. However, these beneficial effects may not be readily apparent because other roads in these watersheds and from Upper West Fork Cow Creek HUC 6 would continue to contribute to stream sedimentation.

Cumulative effects of the action on stream sediment would be undetectable at the 6th field watershed scale because of project design, including unit placement, and use of appropriate BMPs (USDI, 1995) and PDFs for minimizing the amount of sediment that project activities contribute to streams. Total road density and potential for soil erosion would not increase because no new permanent roads would be built.

Stream Channel Stability - It is unlikely that any timber sale activity (i.e. log yarding and hauling; temporary road construction; road renovation, road construction, road decommissioning, gating, or site preparation) under the Proposed Action, other than tree felling, would have any effect whatsoever on peak or base flows because they have no mechanisms to decrease canopy closure or to increase runoff from compacted areas.

According to Watershed Professionals Network, there is potential risk of peak flow enhancement when 40% of a watershed is in the TSZ (above 2500 feet in the Planning Area) and when more than about 75% of the acreage in the TSZ has less than 30% canopy closure Although about 40% of the Gold Mountain 6th field watershed is in the TSZ, no more than 23% is presently in open condition. That is, at least 77% is functioning at hydrologic potential (Table 3-9). GS treatments (Table 3-10) would create 23 one acre openings in the forest canopy across five widely separated harvest units (11-1, 15-2, 17-1a, 17-1b and 27-6) and there would be only a four acre RH unit. All other harvest would retain at least 30% canopy closure, including OR units, which have advanced conifer reproduction in the understory in addition to hardwoods and brush that would respond quickly to removal of overstory conifers. It is therefore highly unlikely that proposed harvest in the TSZ would have any measurable effect on peak flow and

streambank stability or on survival of fish (including OC coho salmon), amphibians or other aquatic species.

Table 3-9. Effects of Alternatives on vegetation (hydrologic functioning) condition in the Gold Mountain Creek 6th field watershed (in the transient snow zone only).

HUC 6 Subwatershed	Alternative 1 (No Action – baseline)		Alternative 2	
	Acres in properly functioning condition *	Percent of all TSZ acres	Minimum acres in properly functioning condition **	Percent of all TSZ acres
Gold Mountain (6607 acres in the TSZ)	5104	77	4995	76

* Landsat remote sensing technology was used to determine the percentage of the HUC 6 where openings in the forest canopy appeared (minimum resolution= 1.1 acres) between 1974 and 2002. Acreage where openings did not appear during this time period is assumed to be largely or in fully functioning hydrologic condition since vegetation is in an advanced stage of hydrologic recovery after 20 years and substantially complete by age 30 (Harr 1989; Adams and Ringer 1994). Vegetation in these categories is considered to be in properly functioning hydrologic condition. (An exception to this is land in non-forest - agricultural and rural residential land, roads, rock quarries, etc. that has been in this condition for decades and most likely would not change for the foreseeable future). Open, compacted acres due to road construction represent approximately 2% of total acreage in the Planning Area. Openings that appeared between 1974 and 2002 are in various stages of hydrologic recovery. Therefore, estimated percent of acres in proper hydrologic functioning condition in are **minimums**. Percentage of acreage in non-forest openings is included in the pre- and post-harvest calculations.

** The **minimum** % of all acres that would be in hydrologic recovered condition under each Alternative. Any appreciable disturbance to the forest canopy is counted as decreasing canopy closure. RH, GS, OR, CT and SC units are given equal weight for this analysis, although the amount of residual vegetation would be considerably greater following CT than after RH.

Table 3-10. Planned harvest in relation to the transient snow zone.

Unit number	Harvest type	Yarding method	Below the TSZ (acres)	Within the TSZ (acres)
11-1	GS (within 15 acre unit boundary)	Cable		4
15-2	CT	Cable	20	67
	GS (9 one acre openings within the other 87 acres)			9
17-1a	GS (within 17 acre unit boundary)	Heli	2	1
17-1b	CT (2 one acre openings within unit)	Heli	11	
23-1	OR	Heli 10 ac Tractor 6 ac		16
23-2	SC	Cable		6
23-4	CT	Tractor 4 ac Cable 6 ac		10
27-2b	CT/RH	Cable	4	
27-3b	OR/CT	Cable	5	
27-3c	OR	Cable	1	
27-4	OR	Tractor 2 ac Cable 1 ac	3	
27-6	GS	Tractor	5	
33-1	CT(60% retention)	Cable 17 ac Tractor 16 ac	33	
Total acres			84	113

If a large portion of a watershed is less than 30 years of age, there is risk of increased water yield. Forest vegetation is generally in an advanced stage of hydrologic recovery 20 years after disturbance and substantially completed by age 30 (Harr; Adams and Ringer). Vegetation in these categories is considered to be in properly functioning hydrologic condition. NOAA Fisheries, et al. (2004) considers a watershed with more than 15% in open canopy condition to be not properly functioning and at risk for increasing peak flows. This baseline is low compared to other research. After reviewing 94 watershed experiments from around the world, including 15% from the Pacific Northwest, Bosch and Hewlett concluded that water yield increases are usually only detectable when at least 20% of the forest cover has been removed. Stednick (pp. 75-79) evaluated twelve studies in the Pacific Coast hydrologic region and determined there is no measurable annual water yield increase until at least 25% of the watershed is harvested. No more than 26% of the Gold Mountain Creek 6th field watershed is in hydrologically unrecovered condition.

It is unlikely that any of the planned harvest (within and below the TSZ), would measurably increase peak flow, indirectly affecting stream channel morphology or streambank stability, because the number of disturbed acres in the Gold Mountain 6th field watershed would increase

by only 1% from the current 26% (18% by including the 1,338 acres that are between 18 and 28 years of age; Table 3-5). That is, at least 73% of all acres (Table 3-11) in the watershed would still be functioning properly from a hydrologic standpoint following the proposed harvest. In addition, proposed harvest units are spread across most of the 6th field watershed, limiting potential for increasing peak flow in any single stream It is expected that canopy condition and hydrologic recovery in CT and OR would return to baseline (pre-harvest) conditions within 5 to 10 years, SC in 10 to 15 years, and within 20 to 30 years in GS and RH units. Effects of historic wildfire resulted in far greater acreage in open condition (no or minimal ground cover or canopy closure) and (most likely) higher peak flows in the Cow Creek watershed and Klamath Province than at present (Grave Creek Watershed Analysis, 1999). Existing stream channel capacity reflects peak flow conditions under historic wildfire regimes (Harr).

Table 3-11. Effects of Alternatives on vegetation (hydrologic functioning) condition in the Gold Mountain Creek 6th field watershed.

HUC 6 Subwatershed	Alternative 1 (No Action – baseline)		Alternative 2 Proposed Action	
	Acres in properly functioning condition *	Percent of all 6th field watershed acres	Acres in properly functioning condition **	Percent of all 6th field watershed HUC 6 acres
Gold Mountain/Panther (16,394 total acres)	12,090	74	11,893	73

* - same as above table

** - same as above table

The 4 acres (less than 0.1% of the Planning Area) of soil compaction that would result from the Proposed Action [0.2 acres (1.6 miles) of temporary haul road and 4 acres of designated skid roads across 33 acres tractor logging units) would have no effect on surface runoff or streamflow because tilling compacted soil with a winged ripper would shatter compaction by as much as 80% (Froehlich and Miles; Andrus and Froehlich; Davis 1990), and substantially restore water infiltration rate during storms.

In summary it is very unlikely that the Proposed Action would increase peak flow at the 6th field watershed scale because nearly 90% of all proposed harvest would retain at least 30% canopy closure. Road density would not increase; other compaction would increase only slightly and be within an acceptable level (RMP/EIS).

Potential for an increase in baseflow in small streams (e.g. 1st and 2nd order) next to harvest units would be greater next to RH units than CT because RH retains less vegetation following harvest (e.g 6 to 8 large trees per acre compared to at least 40% canopy closure). Although higher baseflow in small streams would provide more habitat for aquatic life for several years (Ziemer

and Lisle, pp. 43-68), the effect would not be apparent in fish-bearing streams because their streamflow originates from much larger watersheds than would be affected by RH harvest units.

Therefore, the Proposed Action would not have incremental effects to past, present and reasonably foreseeable future actions on aquatic habitat beyond the limits of the Planning Area. There would be no effect on riparian habitat, stream habitat connectivity and stream channel stability and only an immeasurable negative (short term) and positive (long term) effect on stream sediment at the project and 6th field watershed scales. The project would not negatively affect endangered species act (ESA) listed Oregon Coast coho salmon (federally proposed as Threatened) and Oregon Coast steelhead (Candidate) because the amount of sediment that reaches habitat for these species would be immeasurable.

Essential Fish Habitat (EFH)

Activities associated with the Willy Slide timber sale would have **no adverse effect** on EFH for Oregon coast coho salmon because the amount of sediment that reaches coho habitat would be immeasurable and indistinguishable from background levels. Effects on EFH would be minimized or prevented by incorporating PDFs Section 2.3 and BMPs (USDI 1995) into the Proposed Action in accordance with the Northwest Forest Plan and the Medford District RMP Record of Decision.

3.5 Soils

3.5.1 Affected Environment

Soils in the Planning Area are derived primarily from metamorphic sedimentary and volcanic rocks of the Dothan formation and sedimentary rocks of the Looking glass formation. Soils on ridgetops and on slopes greater than about 50% tend to have shallow soils with 4 to 24 inches of gravelly loam. These soils are often droughty and growth of vegetation is slow (less than one foot per year on conifers), depending on species. Soils on the lower 2/3 of most slopes vary in depth between 25 to >60 inches. Soil depth is less on convex slopes and greater on the concave portion. Both geologic types exhibit mass movement depositional features in the form of ancient rotational and translational blocks. Most are stable at this time and exhibit no signs of additional movement, such as jack-strawed trees and expansion cracks. Some of these areas of recent and ancient instability are associated with faults, both within the geologic types or along contacts between geologic types.

Soil type, which is provided in individual unit Silvicultural Prescriptions in Appendix 4, is used in the Timber Production Capability Classification (TPCC) to determine relative site productivity/ site class and helps determine the types of silvicultural practices that may be appropriate at specific locations.

All proposed harvest units have been examined for current and potential slope stability problems by a qualified resource specialist. For instance, part of the hillside east of lower Panther Creek containing units 27-1 and portions of 27-2 were deferred from further consideration because of concerns about potential slope instability. Hillslopes within other proposed harvest units and adjacent to streams are stable and well-vegetated. Information for soils in the Planning Area was derived from NRCS Douglas County Soil Surveys and has been ground-verified by BLM personnel.

3.5.2 Environmental Effects

Alternative 1 (No Action)

There would be no soil disturbing activity or compaction on BLM lands through the proposed project. However, there would be ongoing harvesting and road building on private lands. Harvest would occur at another location under separate NEPA analysis in order to meet harvest commitments identified in the RMP (pp. 3, 17). Selection of this alternative would not constitute a decision to reallocate these lands to non-commodity uses. Future harvesting in this area would not be precluded and could be analyzed under a subsequent EA.

Alternative 2 (Proposed Action)

Activities that are proposed under the Proposed Action would cause soil displacement, compaction and loss of productivity on acres of ground that are associated with landings, cable yarding, tractor logging and construction of temporary roads. However, implementing Best Management Practices (BMPs) in Appendix D of the RMP should prevent unacceptable degradation of the soil resource (RMP EIS Volume 1, pp. 4-12 and 13). Cable harvesting would result in compaction on about 4% of each harvest unit and about 1% of helicopter-logged units and 0.0015 % of new temporary roads within the Planning Area. About 12% of the ground in tractor logging units (using designated skid roads) would experience moderate compaction (Clayton; Dyrness). Additionally, ripping compacted ground would shatter soil compaction by as much as 80% (Froehlich and Miles; Andrus and Froehlich; Davis).

Sub-soiling tractor skid trails and helicopter landings would increase potential for soil movement but it would not contribute to stream sedimentation because areas to be sub-soiled are not near streams. Movement of soil from cable yarding routes is unlikely because it would be trapped by logging slash or filtered by vegetation on undisturbed ground. There would be a small but acceptable loss of soil productivity following sub-soiling since nutrients would still be available for reestablishment and growth of vegetation.

The standard for the Medford District Field Office for acceptable soil productivity losses is stated in the RMP/EIS on pages 4-12 and 4-13 of volume 1. This standard was developed primarily from the research of McNabb and Froehlich and Wert and Thomas, which indicated that the loss of soil productivity of a given harvest unit was equivalent to approximately one-half

of the amount of the area subjected to compaction. The threshold of approximately 5% soil productivity loss from timber harvest activities as identified in the RMP/EIS equates to an allowance of approximately 12% area to be compacted. With the implementation of the BMPs (RMP, pp. 166-167) for slope restrictions on tractor operations (<35%), proper equipment for reducing compaction (winged toothed ripper), and skid trail spacing (150 feet), it is expected that amelioration efforts would be effective at meeting identified targets for soil productivity. These PDFs are included in section 2.3.3 of this EA. Loss of soil productivity due to compaction is accounted for in the non-declining timber harvest calculations (RMP/EIS, p. 4-12).

Site preparation would improve planting access. While pile and burn is proposed to be done under cool, moist conditions, there is a possibility that fire could be more intense than desired and reduce but not destroy the organic litter layer, which would be wet at the time of the burn. Site productivity should therefore be maintained in the long term. Bare soil exposed from prescribed burning would not exceed guidelines in the Monitoring Handbook.

There would likely be no adverse incremental addition to other past, present and future compaction and soil displacement at the project level not already considered under the RMP since all new temporary roads and all tractor yarding compaction in tractor units would be sub-soiled. In addition to the sub-soiling, there would be the ongoing natural healing of compaction and soil displacement on BLM surface inside the Gold Mountain 6th field watershed where past ground-based operations extensively occurred on slopes less than 40 percent. Even though this natural process is very slow, it and the sub-soiling amelioration combined insure that soil productivity at the watershed level would be at least maintained on BLM surface.

Chapter 4.0 List of Preparers

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

Name	Title	Responsibility
Bob Bessey	Fisheries Biologist	Fisheries, Riparian, Soils, Water, ACS
Dustin Wharton	Civil Engineering Technician	Roads
Sarah Bickford	Forester	Timber, logging systems
Terri Brown	Fuels Specialist	Fuels, Fire
Marlin Pose	Wildlife Biologist	Wildlife
Doug Stewart	Forester	Silviculture
Rachel Showalter	Botanist	Botany
Katie Wetzel	Outdoor Recreation Planner	Visual Resources
Amy Sobiech	Archaeologist	Cultural Resources
Michelle Calvert	Natural Resource Specialist	NEPA specialist
Martin Lew	NEPA Planner	Team leader, NEPA writer/editor

Chapter 5.0 Public Involvement and Consultation

5.1 Public Scoping and Notification

5.1.1 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 the Willy Slide Timber Sale Project upon the Northern spotted owl has been completed. The Willy Slide Timber Sale 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 NOAA Fisheries (National Marine Fisheries Service)

In accordance with regulations pursuant to Section 7 of the Endangered Species Act of 1973, as amended, informal consultation concerning the potential impacts of the Proposed Action on Oregon Coast Coho salmon has been completed (*NOAA Fisheries reference* 2004/01046).

NOAA Fisheries also concurred that consultation under the Magnuson-Stevens Fishery Conservation and Management Act was not required as the Proposed Action would have no adverse impact to Essential Fish Habitat for any population of Chinook or Coho salmon.

5.2.3 State Historical Preservation Office

The State Historical Preservation Office approved the clearance/tracking form for the Willy Slide Timber Sale. The form is contained within the Willy Slide Analysis file.

Acronyms and Glossary

Abbreviations:

ACS	Aquatic Conservation Strategy
BLM	Bureau of Land Management
BMP(s)	Best Management Practices
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
NFP	Northwest Forest Plan
ODFW	Oregon Department of Fish and Wildlife
OR	Overstory Removal
RH	Regeneration harvest
SC	Selection Cut
USDI	United States Department of Interior
USFWS	United States Fish and Wildlife Service
WFCC	West Fork Cow Creek

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.

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.

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.

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. Federal lands outside of reserves and special management areas that will be available for timber harvest at varying levels.

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 achieve.

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.

Renovation – Roads. Restoration of the road to the original standard by surface grading, spot rocking, reshaping ditch lines, improving and installing additional drainage structures and replacement of deteriorating culverts. Renovation also includes converting road prisms from ditched to out-sloped roadbeds with waterdips, which reduces long-term maintenance costs and properly drains roads during storm events.

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. Streamsides, 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.

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APPENDIX 1 ALTERNATIVE DEVELOPMENT SUMMARY

Environmental Assessment Number OR118-05-006

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.*

   No, there are no unresolved conflicts concerning alternative uses of available resources. The rationale is:

   The original project was analyzed under the Willy Slide Project EA (#OR118-04-015) and was available for public comment in July, 2004. One comment letter from Klamath Siskiyou Wildlands Center (KS Wild) stated that the two action alternatives were indistinguishable. The interdisciplinary team (IDT) originally developed two action alternatives that were constrained by elk management area objectives (Roosevelt elk is not a threatened and endangered species or special status species). The Glendale Field Manager agreed with the public comment and eliminated Alternative 3.

   KS Wild made a proposal for another alternative that did not decrease late-successional cover, build new roads or increase openings in the transient snow zone. The IDT developed an alternative in response to this public comment which entailed the thinning of approximately 76 acres using a combination of helicopter and conventional logging systems. This alternative was dropped from further consideration as it was not economical due to the high costs associated with helicopter logging that would not be offset by the anticipated volume from thinning 76 acres. If the alternative had been analyzed in detail the effects of such an alternative would be similar to the No Action Alternative.

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.*

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.*

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.*

APPENDIX 2 ENVIRONMENTAL ELEMENTS

Environmental Assessment Number OR-118-05-06

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 two 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 teams predicted environmental impact per element if the 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 C 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. Activity fuels would be burned in accordance with the *Oregon State Implementation Plan*, *Oregon Smoke Management Plan and Visibility Improvement Plan.* 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 Planning area.
Cultural, Historic, Paleontological	Not Present	Cultural resource surveys were conducted and no new archaeological sites were identified. If cultural resources are found during the implementation of an action, the project may be redesigned to protect the cultural resource values present, or evaluation and mitigation procedures would be implemented based on recommendations from an Archaeologist.
Energy (Executive Order 13212)	Not Present	There are no known energy resources located in the Planning area. The Proposed Action will have no effect on energy development, production, supply and/or distribution.
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 Present	

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 teams predicted environmental impact per element if the 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 C of the RMP to reduce or avoid environmental harm**
Flood Plains (Executive Order 11988)	Not Affected	The Proposed Action does not involve occupancy and modification of floodplains, and will not increase the risk of flood loss. As such, the Proposed Action is consistent with Executive Order 11988.
Hazardous or Solid Wastes	Not Affected	There would be no environmental effects associated with this element due to the implementation of the Best Management Practices contained in the Medford RMP and the terms/conditions of the timber sale contract. Failure to comply with the terms and conditions of the timber sale contract can result in violations, suspension or cancellation of the contract.
Invasive, Non-native Species (Executive Order 13112)	Not Affected	The Planning Area has only a few individual scotch broom plants located along two roads, 31-9-27.5 and 31-9-22. Prior to initial move-in and all subsequent move-ins into the Planning Area, heavy equipment would be washed to remove soil and plant parts that could spread invasive and noxious weeds. As such, the Proposed Action is not anticipated to increase the spread of noxious weeds and/or invasive non-native plant species.
Native American Religious Concerns	Not Present	
T/E (Threatened or Endangered) Fish Species or Habitat	Affected (Coho salmon and steelhead) Not Present (Chinook salmon)	Affected: The Proposed action may affect key elements of stream habitat (riparian reserves, streambank sediment, stream channel stability, and habitat connectivity) which may have an adverse impact on Oregon Coast coho salmon (federally proposed as Threatened) and Oregon Coast steelhead (Candidate). The unit of measure is a narrative on each key element of stream habitat. *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.* Not Present: Chinook salmon occur in downstream reaches of West Fork Cow Creek but are not known to have ever utilized the streams in or adjacent to the Planning Area.
T/E (Threatened or Endangered) Plant Species or Habitat	Not Present	Surveys were conducted throughout the proposed project area and no T/E species were found. This is outside the natural range and habitat of the T/E botany species.

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 teams predicted environmental impact per element if the 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 C of the RMP to reduce or avoid environmental harm**
T/E (Threatened or Endangered) Wildlife Species, Habitat and/or Designated Critical Habitat	Affected (NSO - species and its habitat, including designated Critical Habitat; Fisher - habitat) Not Present (MAMU, including habitat; Bald Eagle)	Affected: The Proposed Action would impact suitable habitat for the northern spotted owl (NSO, Threatened), and fisher (Candidate). Additionally, the Proposed Action would impact NSO critical habitat. The unit of measure is the acres of suitable habitat degraded or removed and a narrative description of impacts to the function of the CHU (critical habitat unit). 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. *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.* Not Present: Surveys were conducted for MAMU (marbled murrelet) and there were no detections. The Proposed Action would not occur within designated MAMU critical habitat. The bald eagle is not present in the Planning Area.
Water Quality (Surface and Ground)	Not Affected (water temperature)	The Oregon Department of Environmental Quality has listed the mainstem of West Fork Cow Creek, Elk Valley Creek below and above the confluence with East Fork Elk Valley Creek, and Slide Creek (in West Fork Cow Creek HUC 5) as water quality limited for water temperature during summer. There are no proposed harvest units adjacent to any of these streams. As such, the Proposed Action would not alter water temperature. The overall effects of the Proposed Action on water quality are expected to be neutral in the short-term and long-term, and the State of Oregon water quality standards would not be exceeded.
Wetlands (Executive Order 11990)	Not Present	The Proposed Action would 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	

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 C of the RMP to reduce or avoid environmental harm**
Elk Management Area (EMA)	Not Affected	The Proposed Action would not affect elk population levels within the EMA. Deferral of harvesting large blocks of late-successional habitat, no permanent road construction and closure of unnecessary spurs not under right of way agreements, would maintain stable populations of elk on federal lands. A replacement gate would be installed on road 31-9-26 that would reduce vehicle access to approximately 6 miles of road and improve the effectiveness of elk forage, hiding, and thermal cover by restricting vehicle access and disturbance. Group selection harvest openings would provide early- successional forage habitat.
Essential Fish Habitat (Magnuson-Stevens Fisheries Conservation and Management Act)	Affected (Coho salmon) Not Present (Chinook salmon)	Affected: The Proposed Action may affect EFH (Essential Fish Habitat) for Oregon Coast Coho salmon. The unit of measure is a narrative that describes whether the action would result in adverse effects to EFH. *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.* Not Present: Chinook salmon occur in downstream reaches of West Fork Cow Creek but are not known to have ever utilized the streams in or adjacent to the Planning Area.
Fire Hazard/Risk	Affected	The Proposed Action would create activity fuels which will increase fire risk in the short-term (until the activity fuels are treated). Additionally, after the stands are re-established in the 52 acres of RH, GS and OR, it will have an increase in flammability until the stand develops into an older age class. The unit of measure is a narrative. *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.*
Land Uses (right-of-ways, permits, etc)	Not Affected	The Proposed Action would not have adverse or beneficial effects to any existing land use.
Late-Successional Forest	Proposed action is in compliance with the 15% Standard and Guideline	Federal ownership of late-successional forest is approximately 54% (USDI 1997) of the entire West Fork 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 timber sales (Mr. Wilson, Bear Pen) would remove approximately 400 acres of late-successional forest. The cumulative removal of late-successional forest from the proposed Willy Slide Timber Sale, and these recent timber sales, is approximately 3% of late-successional lands within the West Fork Cow Creek watershed. As such, the Proposed Action is in compliance with the 15% Standard and Guideline.
Mineral Resources	Not Present	

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 C of the RMP to reduce or avoid environmental harm
Port Orford Cedar	Not Affected	There is no POC (Port Orford Cedar) located within proposed treatment units. Approximately ten POCs are present along roads 31-8-31 and 31-9-11 in T31S-R09W-Sec 11, 12 & 14, and one seedling near road 31-9-27 in T31S-R09W-Sec 27. There is no evidence of POC root rot disease, PL (*Phytophthora lateralis*), in any of the units along the roads mentioned above, with the exception of three trees located 50-100 feet below road 31-8-31 in section 11. These three infected trees are downstream from the uninfected trees along the road in section 11 & 12. Road 31-8-31 is a paved road open to public use year-round. The risk of spread from the three possibly infected trees is very low, as a result of this action, as the trees are located below the road and no activities are planned around these trees. The risk of spread is further reduced by project design features such as log hauling only during the dry season and washing equipment before entering the Planning Area. POC near the proposed haul routes are a minor component of the stands at these locations. Loss of POC, due to infection, in these areas would not prevent land and resource management objectives from being met because the ecological conditions and forest structures would not be measurably affected by the loss of a few scattered trees in the area. A POC Risk Key analysis was conducted and found: 1/ there are no uninfected POC within, near or downstream of the Proposed Action whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives; 2/ there are no uninfected POC within, near or downstream of the Proposed Action that, were they to become infected, would likely spread infections to those trees whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives; and 3/ the Proposed Action does not occur within an uninfested 7th field watershed.
Recreation	Not Affected	The primary recreational use occurring within the Planning Area is hunting. Although the Proposed Action may displace some hunters during actual logging operations, the action would not preclude hunting in other areas. As such, the Proposed Action would not affect this environmental element.
Rural Interface Areas	Not Present	
Special Areas (not including ACEC, RMP pp. 56-62)	Not Present	

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 C of the RMP to reduce or avoid environmental harm**
Special Status Species (not including T/E): Fish Species/Habitat *	Affected (Pacific lamprey, Oregon Coast cutthroat trout)	The Proposed Action may input sediment into streams. However, besides Special Status T&E and candidate species, there are no other Special Status species within the Planning Area. Pacific lamprey and Oregon Coast cutthroat trout are Bureau Tracking species, which are not categorized as Special Status for management purposes. *Refer to Section 3.4 of the EA for a discussion of the affected environment and environmental effects of the alternatives related to the habitat of the environment.*
Special Status Species (not including T/E): Plant Species/Habitat *	Not Present	Surveys were conducted throughout the Planning Area and 1 species (Allium bolanderi var. mirabile) a bureau tracking vascular plant was located in unit 33-1. Tracking species are not categorized as Special Status for management purposes.

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 C of the RMP to reduce or avoid environmental harm**
Special Status Species (not including T/E): Wildlife Species/Habitat *	Not Present or Not Affected (All other species)	<u>Not affected</u>: northern goshawk (Bureau Sensitive)-The Proposed Action would remove approximately 68 acres providing nesting habitat. There is a possible site in the Planning Area outside of proposed units. However, there is sufficient mix of seral stages in the Planning Area, including 100ac spotted owl cores, riparian reserves, LSR/marbled murrelet reserve, and deferred LSH blocks to provide nesting, fledging, and foraging habitat. Viability rating would remain unchanged. (USDA/USDI 1994a 3&4 p179) fringed myotis (Bureau Assessment). Utilizes old growth habitat. Although there are no known sites, this species is likely to occur in Planning Area. Approximately 68 acres (11-1,17-1b, 23-1, 23-2, 23-4, 27-2b, 27-3b, 27-3c, 27-4 and 27-6) of late-successional habitat would be reduced to the retained snags and green trees. Some suitable snags may be felled. RMP ROD 40% population level for cavity nesters, riparian reserves, LSR/marbled murrelet reserve, 100ac owl cores, connectivity blocks, deferred large blocks of LSH, Bobby Creek RNA, maintain sufficient distribution of LSH habitat in planning area. NFP with Standards and Guidelines would provide 80% or greater likelihood of sufficient distribution of habitat (1994a p.3&4-187). This project would maintain the viability level. Bureau Sensitive Northwestern pond turtle - Is not found in units but resides in streams Oregon Shoulderband (snail)-Likely to occur in the project area, typical rock talus, rock outcrop, grass-hardwood meadow habitat is not found in units Bureau Assessment foothill yellow-legged frog -Is not found in units but resides in streams Pacific pallid bat - Likely to occur in the project area, typical rock outcrop and cliff roosting habitat is not found in units <u>Not present:</u> 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), white-tailed kite

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 C of the RMP to reduce or avoid environmental harm**
Soil (productivity, erodibility, mass wasting, etc.)	Affected	The Proposed Action will result in soil compaction/disturbance that may reduce soil productivity. The unit of measure is a narrative description of soil compaction/disturbance and productivity. *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.*
Visual Resources	Not Affected	The Planning area is located within the Class 4 VRM (Visual Resource Management) category which allows for major modification of the existing character of the landscape. The Proposed Action is consistent with these visual resource management objectives. The visual contrast rating sheets are within the Project Record.

*Bureau Special Status Species Policy for sensitive species requires that the BLM protect, manage, and conserve those species and their habitats such that any Bureau action would not contribute to the need to list any of these species. Bureau Assessment species, which are not eligible for federal listing status like sensitive species, but are of a concern in Oregon might, at a minimum, need protection or mitigation in BLM activities. Bureau Tracking species are not considered special status species for management purposes, but are documented when found so as to better determine their status and distribution. These species do not require management or mitigation (IM OR-2003-054).

Appendix 3 CHECKLIST FOR DOCUMENTING ENVIRONMENTAL BASELINE AND EFFECTS OF PROPOSED ACTION(S) ON RELEVANT INDICATORS

Project Name:
Willy Slide Timber Sale

6th Field HUC or Project Scale:
Gold Mountatin/ Panther Creek

Date: Preparer(s): Bob Bessey (Fish)
Loren Wittenberg (Hydrology/ Soils)

Physiographic Province:
Klamath/Siskiyou

Resource Area, Medford BLM
Glendale Resource Area

		Current Condition			Alternative 2			
		Properly Functioning[1]	**At Risk[1]**	***Not* Properly Functioning[1]**	**Restore[2]**	**Maintain[2]**	**D egrade[2]**	
Water Qual.	Temperature		BLM			X		
	Sediment		AM			X		
	Chem. Contam./ Nutrient Load	PJ				X		
	Physical Barriers	WA				X		
Habitat Elements	Substrate		AM			X		
	Large Woody Debris			ODFW		X		
	Pool Frequency		ODFW			X		
	Pool Quality			ODFW		X		
	Off-Channel Habitat		ODFW; PJ			X		
	Refugia			WA;PJ		X		
Chan. Cond. & Dyna.	Width/Depth Ratio	ODFW				X		
	Streambank Condition	ODFW				X		
	Floodplain Connectivity	WA;PJ				X		
Flow/Hydro	Peak/Base Flows		WA;PJ			X		
	Drainage Network Increase			WA		X		
Wshed Condition	Road Density and Location	WA;PJ (location)		WA (density)		X		
	Disturbance History		WA			X		
	Landslide Rates	WA;PJ				X		
	Riparian reserve			WA		X		

1 These 3 categories of function ("properly functioning," "at risk," "not properly functioning") are defined for each indicator in the "Matrix of Factors and Indicators" for each physiographic province as agreed to by the ESA Level 1 Teams.

The effects of the action are based on which way the project is likely to move a relevant indicator. However, no changes in baseline conditions are expected. For the purposes of this checklist, "restore" means to move an "at risk" indicator toward "properly functioning" or a "not properly functioning" indicator toward "at risk" or "properly functioning." "Maintain" means that the function of an indicator does not change. "Degrade" means to move the function of an indicator for the worse (i.e. it applies to all indicators regardless of functional level).

Codes:

BLM Water temperature data
ODFW: ODFW stream habitat survey data
PJ: Professional judgement
WA: West Fork Cow Creek Watershed Analysis
AM: Aquatic macroinvertebrate survey and report.

Appendix 4 SILVICULTURAL PRESCRIPTION

WILLY SLIDE TIMBER SALE

I. INTRODUCTION

The Willy Slide timber sale is located in T.31S., R09W., Sections 11,15,17,23,27,33. This sale is in the West Fork Cow Creek Ecosystem Analysis Area, a fifth field watershed as designated in the Medford District RMP, and it encompasses portions of 7 seventh field watersheds. All of the sections in this project area are part of the matrix land allocation as specified in the Medford District Resource Management Plan (RMP). The project area was chosen to be part of a contract with a qualified consultant to develop a timber sale plan, silvicultural recommendations, and Environmental Assessment for the designated Willy Slide area. The objectives were developed from the Medford RMP and refined for this project area by the contractor consultant team. These objectives and the entire project were reviewed during the developmental steps at intervals throughout the process by a BLM interdisciplinary (ID) team. The sale was then reviewed and amended by a BLM ID team consisting of a wildlife biologist, soil scientist/hydrologist, recreation planner, realty specialist, fire/fuels ecologist, botanist, timber planner, and silvicultural prescription writer.

II. OBJECTIVES

The overall objectives for matrix land allocation in the Medford RMP include:
-produce sustainable supply of timber and forest commodities,
-produce connectivity between late-successional reserves,
-provide for organisms associated with both late-successional and younger forests and their dispersal,
-provide early-successional habitat.

Specific objectives designed through the ID team for this timber sale include:
-Harvest timber economically, while protecting other resources.
-Minimize movement of sediment into streams.
-Minimize adverse impacts on species associated with late-successional habitat.
-Promote growth and release of existing young conifer stands.
-Improve elk forage habitat within the RMP designated Elk Management Area.
-Control the spread of the Port-Orford-cedar root disease *(Phytophthora lateralis)* within the Planning Area.

Desired Future Conditions:

Commercial Thin stands - A vigorous stand of conifers exhibiting good tree growth, 80%+ canopy closure, scattered large "legacy" conifers, and a component of hardwoods, snags, and residual course woody debris (CWD).

Overstory Removal and Regneration Harvest stands - Scattered overstory of large "legacy" conifers (6 -10TPA) with well-stocked understory of vigorous conifers, and component of hardwoods, snags, and residual course woody debris (CWD).

Group Selection stands – A stand of large conifers with small openings, up to 1 acre in size, having a variety of young conifers and shrubs for elk forage imitating small root rot pockets or windthrow openings in a mature stand with a component of hardwoods, snags, and residual course woody debris (CWD) in the overall stand.

Port –Orford Cedar (POC):

There is no POC (Port Orford Cedar) located within proposed treatment units. Approximately ten POCs are present along roads 31-8-31 and 31-9-11 in T31S-R09W-Sec 11, 12 & 14, and one seedling near road 31-9-27 in T31S-R09W-Sec 27. There is no evidence of POC root rot disease, PL (*Phytophthora lateralis*), in any of the units along the roads mentioned above, with the exception of three trees located 50-100 feet below road 31-8-31 in section 11. These three infected trees are downstream from the uninfected trees along the road in section 11 & 12. Road 31-8-31 is a paved road open to public use year-round. The risk of spread from the three possibly infected trees is very low, as a result of this action, as the trees are located below the road and no activities are planned around these trees. The risk of spread is further reduced by project design features such as log hauling only during the dry season and washing equipment before entering the Planning Area. POC near the proposed haul routes are a minor component of the stands at these locations. Loss of POC, due to infection, in these areas would not prevent land and resource management objectives from being met because the ecological conditions and forest structures would not be measurably affected by the loss of a few scattered trees in the area.

A POC Risk Key analysis was conducted and found: 1/ there are no uninfected POC within, near or downstream of the Proposed Action whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives; 2/ there are no uninfected POC within, near or downstream of the Proposed Action that, were they to become infected, would likely spread infections to those trees whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives; and 3/ the Proposed Action does not occur within an uninfested 7th field watershed.

III. STAND DESCRIPTION, ANALYSIS, RECOMMENDED TREATMENT

Units 15-2, 17-1b, 23-4, 33-1

Unit	Location / HUC 7	Aspect/ Slope / acres	Elevation/ Ann. Prec.	TPCC/ Soils	Site Index
15-2	31S-09W-15	East 20%-65% 96 ac	2500'-3000' 65"-70"	RMR, RTR. 1510F-Acker-Norling, gravelly clay loam, well-drained, mod. permeability	120-130
17-1b	31S-09W-17 C.	East, SE, NE 20%-50% 11 ac	2300'-2600' 80"-85"	NP, FWR/RMR. 325E-Orford gravelly silt loam, well- drained, mod. slow permeability.	120-130
23-4	31S-09W-23.	South, SE, East 20%-40% 10 ac	2600'-2800' 60"-65"	RTR, RMR 1510F-Acker-Norling, gravelly clay loam, well-drained, mod. permeability. Inclusion of 239G-Atring Vermisa, very gravelly loam.	120-130
33-1	31S-09W-33	South, SW 20%-60% 33 ac	2000'-2400' 70"-75"	RTR, RMR, FGR/RTR 1510F-Acker-Norling, gravelly clay loam, well-drained, mod. permeability. 239G-Atring Vermisa, very gravelly loam, well-drained. 330F-Orford - McDuff, silty clay loam, well-drained.	120

Existing Stand

Overstory – Dominated by DF, with minor component of IC, and in units 15-2, 17-1b occasional WF. Stand tree size is 10"-24" DBH. range and average 12"-18" DBH, while units 23-4, 17-1b, and 33-2a have a greater number of conifers 16" to 24" DBH. Stands range from 180 to 300 ft^2 basal area per acre.
Mid-Canopy - Mix of conifers and hardwoods, 6"-10" DBH. DF is the primary conifer, with IC, WF, WH also present. Madrone is a major hardwood present with chinquapin, tanoak also a

component. Unit 33-1 also has canyon live oak present in varying densities in both tree and shrub form.
Understory – Canopy closures are generally greater than 75% so understory densities tend to be low. DF, WF, WH, IC are the primary conifers present. Hardwoods and shrub densities are also variable, with little present where overstory densities are high. Generally these understories are less than 10' in height. Rhododendron, salal, Orgeon-grape, madrone, tanoak, and hazel are present in these units at low levels for the majority of the areas, except in concentrations in the canopy openings. Canyon live oak it present in dense patches in unit 33-1.

Stand History

Most of these stands are the result of disturbance within the last 100 years. It appears that wildfire was the primary disturbance event in these stands. There are scattered snags and residual large old conifers in these stands, sometimes present in small patches up to an acre in size. There is evidence of some past salvage activity, however in unit 27-2 the trees that were felled decades ago are still laying where they were felled. Unit 15-2 received a commercial thin in 1994, however, harvest was light in most of the area with basal areas presently at 160 to 260 ft^2 per acre.

Recommended Treatment

Commercial Thin **-** Units **17-1b, 23-4.** Thin these stands leaving a residual conifer basal area of approximately 100-120 ft^2 per acre. Species retention should represent the existing mix of species present in the units. Thin from below removing the smaller less vigorous conifers. Leave trees should be the dominant and co-dominate trees with vigorous crowns, generally 30% or greater crown ratios. Retain a minimum of 40% canopy closure. Retain up to 5 tree form hardwoods per acre, if present. In unit 33-1, concentrations of tree-form hardwoods exist. These should be thinned along with conifers to constitute no more than 25% of the stand basal area. Select 2 areas, 1 acre or less in size, scattered throughout the unit, and remove the overstory. These openings are to be created to increase forage for elk in this watershed, while retaining cover in the overall forest area.

Commercial Thin – **Unit 33-1** Thin from below removing the smaller less vigorous conifers. Leave trees should be the dominant and co-dominate trees with vigorous crowns, generally 30% or greater crown ratios. Retain a **minimum of 60% canopy closure.** Canopy closure is the primary feature to consider in retaining the residual stand. Spacing of leave trees will vary and residual conifer basal area will be variable depending on size of trees in stand, however retention of approximately **140 ft^2** per acre basal area would be a target that would likely approximate 60% canopy closure. Canopy closure, however, is the overriding target for this stand, as this unit is in a CHU. Species retention should represent the existing mix of species present in the unit. Concentrations of tree-form hardwoods exist and these should be thinned along with conifers. Hardwoods can be counted towards the total basal area but a minimum of 100 ft^2 conifer basal area should be retained at all times. Existing snags and coarse woody

material should be retained on site

Commercial Thin / Group Selection – **Unit 15-2**. This unit has variable basal area retention from previous thinning and variability of tree sizes that were retained. Thin this unit to open up the conifer crowns for increased growth on residual trees. Remove trees that have crowns touching on 3 of 4 sides (75%) of the reserve tree crowns. The intent is to open up the stand to allow space for crowns of reserved trees to grow without competition from neighboring trees, while retaining cover for elk. Retain minimum of 100 ft^2 per acre conifer basal area and 40% canopy closure. Retain up to 5 tree-form hardwoods per acre, if present.

Select 10 areas, 1 acre or less in size, scattered throughout the unit, and remove the overstory. Expand existing openings in the canopy to create the 10 areas, however, they should be scattered over the unit, not in a concentrated area. These openings are to be created to increase forage for elk in this watershed, while retaining cover in the overall forest area.

Existing snags and coarse woody material should be retained on site. Future recruitment of snags and coarse woody material would come from residual trees in the stand after thinning. Unit 15-2 meets or exceeds the mean length of coarse woody material for all decay classes of the PIEC guidelines (Diane White report).

Fuels Treatment / Site Prep / Planting

Look at these commercial thin units for hazardous fuel reduction through handpiling and burning piles. Consider slashing shrub and suppressed conifers under 6" DBH, and piling with harvest slash. Unit 15-2 will likely not need the slashing of shrubs and suppressed conifers.

Planting should not be necessary in these units with the exception of the group selection openings in unit 15-2. These should be looked at for planting of conifers with DF as the primary species.

Units 11-1, 17-1a, 27-6

	Unit 11-1	Unit 17-1a	Unit 27-6
Location	31S-09W-11	31S-09W-17	31S-09W-27
HUC 7			
Acres	19ac (4 1ac openings)	25ac (3 1 ac openings)	10 ac (5 1 ac openings)
Aspect	West-SW	East, SE, NE	East-NE
Slope	50%-60%	20%-45%	20%-40%

	Unit 11-1	Unit 17-1a	Unit 27-6
Elevation	2500’-2700’	2300’-2600’	1600'-2000'
Ann. Precip.	60"-65"	80"-85"	65"-70"
TPCC	RTR	NP, FWR/RMR	RMR, FWR/RMR
Site Index	110-120	120-130	120-130
Soils	1510F-Acker-Norling, gravelly clay loam, well-drained, mod. permeability. 311E-Preacher-Bohannon loam, well-drained.	325E-Orford gravelly silt loam, well- drained, mod. slow permeability.	58E-Gustin-Orford, clay loam, somewhat poorly drained, slow permeability.

Existing Stand

Overstory – Stands are dominated by DF with occasional WF, IC, WH; 24”-50” DBH with overstory densities ranging from 160 ft^2 per acre to over 300 ft^2per acre. Canopy closures of overstory range from 50% up to 90%. Units 17-1a and 27-6 have the more dense canopies generally above 70%, with some areas more open. Unit 11-1 is a drier site with canopy closures ranging from 50% to 80%.

Mid-canopy - Primarily DF with WF, WH, madrone, tanoak and canyon live oak. Generally comprises only a small portion of overall stand, usually less than 20%, 6”-12” DBH, much of it suppressed by overstory.

Understory - Mix of DF, WF, WH, madrone, CLO, tanoak, salal, and rhododendron, patchy in distribution, primarily in openings in overstory, 2’-10’ in height. Some WRC is also present in unit 27-6. Unit 11-1 has greatest number of patches of understory vegetation, mostly DF and CLO, with occasional DF up to 30” in height.

Stand History

Unit 11-1 is surrounded by past harvest units of varying age. The unit has rocky soils and is a moderately droughty site with CLO as the primary shrub component. Units 17-1a and 27-6 have more dense overstories with less droughty soils, generally good sites. Past harvest in all units has been light, with evidence of very light salvage or single tree selection that appear decades old.

Recommended Treatment

Group Selection – Unit 11-1, select 4, 1 acre areas within the unit spaced throughout the unit. Layout of the openings could be in a line to facilitate a harvest system
Unit 17-1a, select 3, 1 acre areas within the unit spaced throughout the unit.
Unit 27-6, select 5, 1 acre areas within the unit spaced apart.
Remove commercial timber within these openings. Areas within the units, outside of these openings, account for the residual legacy trees in these stands. The objective is to create vertical structure and increase elk forage in dense stands, imitating small openings often created in unentered mature stands when small root rot pockets occur or windthrow creates small openings. Snags and tree form hardwoods should be retained in openings as long as they don't constitute a safety hazard.

Existing snags and coarse woody material should be retained on site. Future recruitment of snags and coarse woody material would come from residual trees in the stand surrounding the harvested openings.

Fuels Treatment / Site Prep

Evaluate after harvest. Consider slashing shrub and damaged conifers under 6" DBH, and piling with harvest slash. Handpile logging slash and burn piles in these units, both for hazardous fuel reduction and site preparation for planting of openings.

Plant the harvested openings with DF and minor component of IC, SP. Plant unit 11-1 with up to 25% mixture of PPine.

Units 23-1, 27-4, 27-3c

	Unit 23-1	Unit 27-4	Unit 27-3b,c
Location	31S-9W-23	31S-09W-27	31S-09W-27
HUC 7	CW0442, Cow ck below Jacob	CW0430, W fk Cow below Goat Trail ck.	CW0433, Bear ck.
Acres	16ac	3ac	b-5ac, c-1ac
Aspect	East, SE-SW	East-NE	East-NE
Slope	30%50%	20%-40%	30%-65%
Elevation	2600'-2900'	1700'-2000'	1700'-2100'
Ann. Precip.	60"-65"	65"-70"	65"-70"

	Unit 23-1	Unit 27-4	Unit 27-3b,c
TPCC	RTR, RMR	RMR	FWR-RMR, RMR
Site Index	120	120-130	120-130
Soils	1510F-Acker-Norling, gravelly clay loam, well-drained, moderate permeability.	58E-Gustin-Orford, clay loam, somewhat poorly drained, slow permeability.	440G-Remote-Digger, very gravelly loam, well-drained, moderate permeability.

Existing Stand

Overstory – Primarily DF with IC & WF present, and scattered WH in units 27-3 and 27-4. Ponderosa and sugar pine replace WF and WH and are present as a minor component in unit 23-1. DBH range is 24"-50", and canopy closures range from 40% to 70% with portions of unit 23-1 having the most open overstory.

Mid-Canopy – Mix of DF, WF, and WH in units 27-3 and 27-4. Unit 23-1 has primarily DF, IC, madrone. DBH range is 8"-18" with canopy closures of the mid-canopy from 20%-70%.

Understory – Units 27-4, 27-3b,c have a mix of DF, WF, WH, WRC, madrone, tanoak, rhododendron, salal, chinquapin, and huckleberry, 4'-30' in height. The understories of units 27-4 and 27-3b are intermixed with mid-canopies and in the openings in the overstory. Unit 23-1 has primarily DF, WF CLO, madrone, and chinquapin, 4'-30' in height with patchy distribution of the conifers.

Stand History

Unit 27-4 has evidence of past harvest with the growth release of some co-dominant confiers about 45 years ago, likely some salvage or selection harvest. All of these units received a selection harvest in 1976, which was generally quite light, but variable in its distribution within the units leaving different densities of overstory.

Recommended Treatment

Overstory Removal / Commercial Thin – Units 23-1, 27-4, 27-3b,c

Harvest the merchantable conifers, over 20" DBH, leaving 8 to 10 of the large conifers per acre "proportionally representing the total range of tree size classes greater than 20 inches DBH and representing all conifer species present (Medford RODS/MFP, 1995)". The leave trees should be spaced throughout with a minimum of 1/3 of the leave trees without obvious defect (conk, insects, etc.).

Portions of the stands in these units that have concentrations of younger vigorous co-dominant and mid-canopy conifers, 10"-18" DBH, which are generally under 100 years old,

should be thinned to allow growth on the residual trees. Remove the trees that are touching the crowns of the selected leave trees allowing space for residual crowns to expand. Thin from below removing the smaller less vigorous conifers. Leave trees should be the dominant, fast-growing conifers with healthy crowns, generally 30% or greater crown ratios. Retain a minimum of 100 ft^2 of residual conifer basal area per acre. Retain up to 5 tree form hardwoods per acre, if present.

Existing snags and coarse woody material should be retained on site. Future recruitment of snags and coarse woody material would come from residual trees in the stand after harvest. Unit 27-4 meets or exceeds the mean length of coarse woody material for decay classes 1,3,5 and the overall total length for all decay classes of the PIEC guidelines (Diane White report).

Fuels Treatment / Site Prep / Planting

Evaluate after harvest. Consider slashing shrubs and damaged conifers under 6"DBH, handpiling of slash, and burning of piles in these units, both for hazardous fuel reduction and site preparation for planting of openings. Avoid existing conifer regeneration as much as possible.

Evaluate these units for condition and density of conifer regeneration after harvest to determine if planting is necessary. In unit 23-1 plant at least 50% P pine if planting is needed.

Unit 27-2b

	Unit 27-2b
Location	31S-9W-27
HUC 7	
Acres	4 ac
Aspect	West
Slope	40%-65%
Elevation	1900'-2200'
Ann. Precip.	65"-70"
TPCC	RTR, FMR/RTR
Site Index	120
Soils	1510F-Acker-Norling, gravelly clay loam, well-drained, moderate permeability. Minor inclusion of 520E-Dumont gravelly loam, well-drained

Existing Stand
Overstory - Primarily DF, with occasional WF, IC, SP, 24”-60” DBH, canopy closures 30% to70%, patchy distribution, 10-30 TPA.
Mid-Canopy – Primarily DF and WF with occasional IC, WH, madrone, chinquapin, 12”-22” DBH, 40%-80% canopy closures, mostly present where there are openings in the overstory, 100-200 ft^2 basal area per acre.
Understory – Mix of DF, WF, with infrequent WH, WRC, 3’-15’ in height, patchy distribution of conifers with overall low stocking. Shrubs include rhododendron, salal, tanoak, and madrone.

Stand History

This unit has had past light harvest, likely of salvage. There are some large trees that were felled approximately 30-40 years ago and not yarded out in one portion of the unit and the decaying logs are present on the site.

Recommended Treatment

Commercial Thin / Regeneration Harvest

This unit has small patches of younger co-dominant and mid-canopy conifers, 10”-24” DBH intermixed with patches of larger, older overstory conifers, generally over 24” DBH. In the areas of concentrations of older trees, harvest the merchantable conifers, over 20” DBH, leaving 8 to 10 of the large conifers per acre “proportionally representing the total range of tree size classes greater than 20 inches DBH and representing all conifer species present (Medford RODS/MFP, 1995)”. The leave trees should be spaced throughout these patches with a minimum of 1/3 of the leave trees without obvious defect (conk, insects, etc.).

In the patches of younger vigorous conifers, up to 24” DBH, thin these stands to allow for growth of the crowns of the residual conifers. Remove trees with crowns touching the selected reserve trees. Thin from below removing the smaller less vigorous conifers. Leave trees should be the dominant, fast-growing conifers with healthy crowns, generally 30% or greater crown ratios. Retain 100 ft^2 basal area per acre in conifers in these areas of younger “second growth”. Retain up to 5 tree form hardwoods per acre, if present

Existing snags and coarse woody material should be retained on site. Future recruitment of snags and coarse woody material would come from residual trees in the stand after harvest.

Fuels Treatment / Site Prep / Planting

Evaluate after harvest. Consider slashing shrubs and damaged conifers under 6”DBH, handpiling of slash, and burning of piles in these units, both for hazardous fuel reduction and site preparation for planting of openings.

Plant regeneration harvest portions of unit with DF as major component, minor amounts of

SP, IC.

Unit 23-2

	Unit 23-2
Location	31S-9W-23
HUC 7	
Acres	6 ac
Aspect	West, Southwest
Slope	30%-55%
Elevation	2500'-2600'
Ann. Precip.	60"-65"
TPCC	RTR
Site Index	110-120
Soils	1510F-Acker-Norling, gravelly clay loam, well-drained, moderate permeability

Existing Stand
Overstory - Primarily DF, with occasional IC, SP, 20”-48” DBH, canopy closures 60% - 80%, 40-60 TPA.
Mid-Canopy – Primarily DF, IC, CLO, madrone, and tanoak, 6”-12” DBH, light densities of 10%-30% canopy closure with dense areas in overstorsy gaps of 40-60% mid-canopy closures.
Understory – Mix of DF, IC, CLO, tanoak, madrone 3’-15’ in height, patchy in unit.

Stand History

Some past light harvest.

Recommended Treatment

Selection Cut

Harvest merchantable conifers, over 20” DBH, retaining15-18 of the large conifers per acre “proportionally representing the total range of tree size classes greater than 20 inches DBH and representing all conifer species present (Medford RODS/MFP, 1995)”. The leave trees should generally be spaced throughout the unit, however leave tree retention should be concentrated in the rockier portions of the unit. The objective is to retain 30-40% canopy closure to assist survival of conifer regeneration as the units are rocky, droughty sites. This

translates to approximately 45'-50' bole spacing of leave trees. Retain up to 5 tree form hardwoods per acre, if present.

Existing snags and coarse woody material should be retained on site. Future recruitment of snags and coarse woody material would come from residual trees in the stand after harvest.

Fuels Treatment / Site Prep / Planting

Evaluate after harvest. Consider slashing shrubs and damaged conifers under 6"DBH, handpiling of slash, and burning of piles in these units, both for hazardous fuel reduction and site preparation for planting of openings.

Plant these units with a mixture of PP, DF, IC. Sites are droughty with Canyon live oak as the primary shrub species.

IV. Coarse Woody Material

Attached is the table depicting the amounts of coarse woody material present on a unit by unit basis. Also attached are the recommended amounts, by decay class, for the plant group represented in this project. Two units meet or exceed the mean lengths for all decay classes, unit 15-2 and 27-4, as shown by the survey for coarse woody material on this project. All other units are deficient in one or more decay classes but may have amounts greater than the mean in other decay classes. Green trees should be retained to recruit future coarse woody material. All units would have adequate green tree retention in residual trees except for regeneration harvest or overstory removal units. Therefore units 27-2b, 23-1, and 27-3b,c, would have 8-10 overstory trees retained instead of 6-8 as required by the Medford RMP/ROD for retention of large legacy overstory trees.

Willy Slide CWD
(by condition class in total linear feet per acre)

Unit	Class 1	Class 2	Class 3	Class 4	Class 5	ROD guidance
11-1	-	-	526'	175'	-	-
15-2	97'	3445'	1456'	2232'	1504'	49'
Unit	Class 1	Class 2	Class 3	Class 4	Class 5	ROD guidance
17-1	-	263'	614'	877'	350'	-
23-1	68'	68'	682'	273'	341'	68'
23-2	-	-	912'	-	-	-
27-2	-	275'	551'	629'	511'	157' $\pm$ 30%

27-3	-	-	-	586'	195'	-
27-4	342'	342'	684'	342'	684'	-
27-6	-	608'	760'	304'	-	304'
33-1		91'	152'	395'	395'	30'

The ROD guidance column indicates how many linear feet of course woody debris exist, that is 16" diameter or greater and 16' or greater in length, and also in decay class 1 or 2

The Provincial Interagency Executive Committee (PIEC) has adopted guidelines for down (course) woody material (CWD) in accordance with recommendations of the Northwest Forest Plan (NFP). The guidelines are stratified by plant association groups, with recommended quantities of down woody material for each group. This is most closely associated with the "Douglas-fir Moist" plant grouping. The recommendations for this group are:

Decay Class	pcs. 6-9"	pcs 10-19"	pcs 20+	Lgth/pc.	Av.Totl.length
1	1 (1)	1 (2)	0 (0)	45 ft. (11)	90 ft
2	6 (20)	6 (16)	1 (4)	31 ft. (21)	403 ft
3	8 (21)	8 (19)	2 (5)	29 ft. (17)	522 ft
4	10 (21)	5 (18)	2 (7)	32 ft. (25)	544 ft
5	2 (9)	11 (22)	1 (1)	22 ft. (32)	308 ft

(The numbers in parenthesis are the standard deviation for each column)

The mean number of pieces, by decay class, is used as the target for coarse woody material retention. The variability around that mean is quite large, as expressed by the standard deviation, so those amounts should not be considered as absolute requirements but they are used as targets for this project.

Organon Stand Growth Model Summary for Commercial Thin Stands

This table is a comparison of different treatments and the model growth projections for thinning from below and proportional at 3 different residual densities.

	Unit 33-1	
	Thin/ 30yr.Gr CC	Total Vol. QMD, CC
100 ft² residual Below	10,715 39,638 50%	50,353 22.3", 60%
100 ft² residual Proportional	18,473 25,738 67%	44,211 14.1", 75%

	Unit 33-1	
120 ft² residual Below	7,878 44,615 62%	52,493 20.6”, 75%
120 ft² residual Proportional	15,834 30,331 81%	46,165 14.0”, 88%
140 ft² residual Below	5,311 48,390 74%	53,701 19.2”, 88%
140 ft² residual Proportional	13,195 34,687 94%	47,882 14.0”, 101%

Willy Slide Marking Guide	
Unit	**Treatment**
17-1b, 23-4, 33-1,	***Commercial Thin*** - Thin these stands leaving a residual conifer basal area of approximately **100-120 ft²** per acre. Species retention should represent the existing mix of species present in the units. Thin from below removing the smaller less vigorous conifers. Leave trees should be the dominant and co-dominate trees with vigorous crowns, generally 30% or greater crown ratios. Retain a **minimum of 40% canopy closure**. Retain up to 5 tree form hardwoods per acre, if present. **In unit 33-1 retain a minimum of 60% canopy closure.** Concentrations of tree-form hardwoods exist. These should be thinned along with conifers to constitute no more than 25% of the stand basal area. Existing snags and coarse woody material should be retained on site. There are 2, 1 acre **group selection** openings spaced throughout unit 17-1b. Remove commercial timber within these openings.
15-2	***Commercial Thin*** -Thin this unit to open up the conifer crowns for increased growth on residual trees. Remove trees that have crowns touching on 3 of 4 sides (75%) of the reserve tree crowns. The intent is to open up the stand to allow space for crowns of reserved trees to grow without competition from neighboring trees, while retaining cover for elk. Retain minimum of 100 ft² per acre conifer basal area and 40% canopy closure. Retain up to 5 tree-form hardwoods per acre, if present. Existing snags and coarse woody material should be retained on site. There are 10, 1 acre **group selection** openings spaced throughout the unit. Remove commercial timber within these openings. Snags and tree form hardwoods should be retained in openings as long as they don't constitute a safety hazard. Coarse woody material should be retained on site.
11-1, 17-1a, 27-6	***Group Selection –*** Unit 11-1, select 4, 1 acre areas within the unit spaced throughout the unit. Unit 17-1a, select 3, 1 acre areas within the unit spaced throughout the unit. Unit 27-6, select 5, 1 acre areas within the unit spaced apart. Remove commercial timber within these openings. Snags and tree form hardwoods should be retained in openings as long as they don't constitute a safety hazard. Coarse woody material should be retained on site.
23-1, **27-4, 27-3 b,c**	***Overstory Removal / Commercial Thin*** **-** Harvest the merchantable conifers, over 20" DBH, leaving 8 to 10 of the large conifers per acre "proportionally representing the total range of tree size classes greater than 20 inches DBH and representing all conifer species present (Medford RODS/MFP, 1995)". The leave trees should be spaced throughout the units with a minimum of 1/3 of the leave trees without obvious defect (conk, insects, etc.). Portions of the stands in these units that have concentrations of younger vigorous co-dominant and mid-canopy conifers, 10"-18" DBH, which are

Willy Slide Marking Guide	
Unit	**Treatment**
	generally under 100 years old, should be thinned to allow growth on the residual trees. Remove the trees that are touching the crowns of the selected leave trees allowing space for residual crowns to expand. Thin from below removing the smaller less vigorous conifers. Leave trees should be the dominant, fast-growing conifers with healthy crowns, generally 30% or greater crown ratios. Retain a minimum of 100 ft^2 of residual conifer basal area per acre. Retain up to 5 tree form hardwoods per acre, if present. Existing snags and coarse woody material should be retained on site.
27-2b	***Commercial Thin / Regeneration Harvest*** **-** This unit has small patches of younger co-dominant and mid-canopy conifers, 10"-24" DBH intermixed with patches of larger, older overstory conifers, generally over 24" DBH. In the areas of concentrations of older trees, harvest the merchantable conifers, over 20" DBH, leaving 8 to 10 of the large conifers per acre "proportionally representing the total range of tree size classes greater than 20 inches DBH and representing all conifer species present (Medford RODS/MFP, 1995)". The leave trees should be spaced throughout these patches with a minimum of 1/3 of the leave trees without obvious defect (conk, insects, etc.). In the patches of younger vigorous conifers, up to 24" DBH, thin these stands to allow for growth of the crowns of the residual conifers. Remove trees with crowns touching the selected reserve trees. Thin from below removing the smaller less vigorous conifers. Leave trees should be the dominant, fast-growing conifers with healthy crowns, generally 30% or greater crown ratios. Retain 100 ft^2 basal area per acre in conifers in these areas of younger "second growth". Retain up to 5 tree form hardwoods per acre, if present Existing snags and coarse woody material should be retained on site.
23-2	***Selection Cut*** **-** Harvest merchantable conifers, over 20" DBH, retaining15-18 of the large conifers per acre "proportionally representing the total range of tree size classes greater than 20 inches DBH and representing all conifer species present (Medford RODS/MFP, 1995)". The leave trees should generally be spaced throughout the unit, however leave tree retention should be concentrated in the rockier portions of the unit. The objective is to retain 30-40% canopy closure to assist survival of conifer regeneration as the units are rocky, droughty sites. This translates to approximately 45'-50' bole spacing of leave trees. Retain up to 5 tree form hardwoods per acre, if present. Existing snags and coarse woody material should be retained on site

Appendix 5. Maps