Five Rogues Project

EA# OR118-04-019

May 2004

Proposed agency actions:	A series of projects proposed to assist in meeting the land use objectives identified in the Medford District BLM Resource Management Plan. Two of the primary needs for this proposal are timber production and hazardous fuels reduction.
Type of statement:	Environmental Assessment
Lead agency:	United States Department of the Interior Bureau of Land Management Medford District, Glendale Resource Area

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Chapter 1 - Purpose and Need

1.1 Introduction

The Glendale Resource Area of the Medford Bureau of Land Management (BLM) is analyzing forest management activities within the Five Rogues Project Area. The Project Area extends from Sexton Mountain north to just beyond Speaker Road and approximately within three miles east and west of Interstate 5. For purposes of environmental analysis, the Project Area is contained within the boundaries of the Wolf Creek, Grave Creek/Sunny Valley and Grave Creek/Placer 6th field watershed boundaries and includes both federally administered public lands, other public lands and private lands, including the communities of Wolf Creek and Sunny Valley. Proposed activities would be limited to federal lands. Alternative 3 is the Proposed Action.

1.2 Purpose and Need

The Glendale Resource Area proposes a series of projects to meet the needs of timber production, fuels hazard reduction, and small wood utilization as identified in the Medford District BLM Resource Management Plan (RMP) dated April 14, 1995. Commercial harvesting would occur on lands identified in the RMP as being within the Northern General Forest Management Area (GFMA). One of the primary objectives of the RMP is that these lands would be managed to assure a high level of sustained timber productivity while maintaining long-term site productivity, biological legacies and a biologically diverse forest matrix (RMP p. 187). Management activities being considered include cutting commercial size timber, thinning overstocked small diameter trees (generally less than 8" diameter at breast height) to be sold for commercial products, also thinning small diameter trees and brush less than 7" diameter at breast height for hazardous fuels reduction.

1.3 Scope of Environmental Analysis

1.3.1 Scoping Process

The first public meeting was conducted for local residents at the Wolf Creek Civic Center in Wolf Creek on April 30, 2003. There were three subsequent public meetings held on October 7, 2003, December 4, 2003 and May 5, 2004. Letters of invitation to each of these meetings were mailed to residents within the Sunny Valley and Wolf Creek communities and Glendale Resource Area's interested party mailing list. Many potential harvest units were deferred or modified primarily due to the involvement of public comments or as a result of public involvement.

1.3.2 Plan Conformance

This Environmental Assessment (EA) tiers to and conforms with the *Final Supplemental Environmental Impact Statement* and *Record of Decision for Amendments to Forest*

Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl (FSEIS,1994 and ROD, 1994); the *Medford District Proposed Resource Management Plan/Environmental Impact Statement* and the *Medford District Record of Decision and Resource Management Plan* (EIS, 1994 and RMP, 1995); the *Final Supplemental Environmental Impact Statement: Management of Port-Orford-Cedar in Southwest Oregon* (FSEIS, 2004 and ROD, 2004); the *Final Supplemental Environmental Impact Statement To Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines* (FSEIS, 2004 and ROD, 2004) and the *Final Supplemental Environmental impact Statement Clarification of Language in the 1994 Record of Decision for the Northwest Forest Plan National Forests and Bureau of Land Management Districts Within the Range of the Northern Spotted Owl, 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. The *Grave Creek Watershed Analysis* is incorporated by reference and is not a NEPA decision document.

1.4 Decisions to be Made

The Glendale Resource Area Field Manager will:

1) Select an alternative.
2) Determine if the selected alternative would have significant effects (and whether to prepare an environmental impact statement) or issue a Finding of No Significant Impact (FONSI).
3) Determine whether the selected alternative is consistent with the Resource Management Plan and the Northwest Plan and its amendments.

1.5 Issues of Concern

The following relevant issues were identified in the project by the interdisciplinary team (IDT) and through comments provided from four public meetings as being potentially significant. This environmental assessment (EA) focuses on these issues, both in terms of project design features (PDFs) and in describing environmental effects.

- Harvesting might effect the view of nearby private landowners
- Harvesting might effect water supplies of adjacent landowners
- Timber products could benefit local and larger scale economies.
- Harvesting of large trees is controversial.
- Permanent road construction would increase the already high road densities. This would increase the potential of stream sedimentation and wildlife harassment.
- Helicopter yarding effects people and wildlife depending on the timing of operation.
- Hazardous fuel buildup has increased the potential for catastrophic fire events within the wildland urban interface and adjacent land management areas.
- Harvesting in the transient snow zone could increase peak flows.

Chapter 2 – Alternatives

2.1 Introduction

This chapter describes the alternative proposals and compares their environmental impacts as specified in 40 CFR § 1502.14. Three action alternatives were developed by the interdisciplinary team after considering the relevant issues identified in chapter 1. Relevant issues also served the purpose of sharply defining potential effects of each alternative. The "No Action" Alternative was analyzed in addition to the three action alternatives. Descriptions focus on potential actions, outputs, and any related mitigation.

2.2 Project Design Features

Project design features (PDFs) are specific measures included in the site specific design of the Proposed Action and alternatives to minimize adverse impacts on the human environment. Many PDFs were developed by the ID team to limit impacts from either one or several alternatives. Where the PDF is limited to one or two alternatives it is so noted. Also, many PDFs are contained under Best Management Practices (BMP), Appendix D, in the Resource Management Plan (RMP). Some of those have been included here for ease of fully understanding the project.

Any changes to PDFs during project implementation would require approval by the Glendale Field Manager.

2.2.1 Fuel Treatments

Piles would be covered to create a dry ignition point and piles would be burned in the fall to winter season after one or more inches of precipitation has occurred to reduce the potential for fire to spread outside each pile and to reduce the potential for scorch and mortality to the residual trees and shrubs. Piles would also be burned when the soil and duff moisture is high to prevent soil damage.

Underburning and broadcast burning could be done anytime throughout the year, typically from fall through late spring, when fuel and weather conditions would permit successful achievement of resource objectives. However, they typically would be conducted from fall to late spring when moisture is appropriate and in a manner that would protect soil productivity, minimize damage to non-target vegetation within treatment units, and to minimize potential for fire to spread outside each treatment unit. Summer or early fall would be less common, but can be feasible when needed to meet resource objectives and when escape fire risk can be mitigated. Underburning would be designed to:

- minimize conflicts with smoke management
- minimize the risk of control problems

- avoid adverse impacts to nesting wildlife species
- minimize consumption of soil organic matter and surface duff
- meet silvicultural objectives to prepare the site and reduce competition with conifer seedlings
- minimize the loss of large down wood
- not exceed guidelines for exposing bare soil (Monitoring Handbook)
- slashing in riparian reserves would be done no closer than 25' of streams
- pile burning would not be within 25' of streams
- underburning would not be within 50’ of streams

Fire lines would be constructed by hand on slopes greater than 35%. On slopes less than 35% a one-pass fire line construction with a brush blade could be used for tractor fire lines. The Field Manager would determine whether planned fuels treatments need specific adjustments to better meet fuels objectives.

Prior to burning, a prescribed fire plan would be completed for the Five Rogues fuels and post harvest burn units. The prescribed fire plan would include acceptable mortality levels. These levels typically limit overstory mortality to 10-15% or less, and understory mortality to 20-50% or less. When prescribed fire is used to “thin-out” understory vegetation (as opposed to thinning with chainsaws), the higher acceptable percentages of mortality would apply. An underburn treatment prescription can range from burning 30% of the area (a “mosaic” burn) up to 90% of the area. Burning would be conducted under conditions that would prevent damage to soils, and consumption of large, woody debris. This would ensure long-term site productivity. Machine fire lines would not be constructed in riparian reserves.

2.2.2 Air Quality / Smoke Management

Air quality is regulated by the 1963 National Clean Air Act as amended in 1966, 1970, 1977 and 1990. The 1977 amendment provided for the prevention of significant deterioration (PSD) program. The intent of the PSD program is to limit air degradation in those areas of the country where the air quality is better than standards. Under this provision, certain national parks and wilderness areas were designated as Class I airsheds, whereas the remainder of the country was designated Class II. Although the PSD permit provisions of the Clean Air Act apply only to major stationary sources of air pollution (motor vehicles are mobile sources), the Environmental Protection Agency (EPA) used them to determine the degree of potential impacts of other sources on air quality. Forest management activities in the analysis area do not require a PSD permit.

All management activities proposed under the action Alternatives would comply with air quality standards and rules administrated by the United States Environmental Protection Agency and the Oregon Department of Environmental Quality. Pollutants of concern are both particulate matter (PM) and inhalable particulate matter (PM_{10} and $PM_{2.5}$). Nitrous oxide, sulfur dioxide and ozone are pollutants of concern, but are at such low levels in the forest environment in Western Oregon that changes in levels are not further considered in this analysis.

The Oregon Smoke Management Plan, a part of the required state implementation plan (SIP), identifies strategies for minimizing the impacts of smoke from prescribed burning on the smoke sensitive areas within western Oregon. Particulate matter with a nominal size of 10 microns or less (PM 10) is the specific pollutant addressed in the SIP.

Broadcast burning would be minimized in favor of lower intensity underburning. Emission reduction mitigation measures and smoke dispersal techniques would be used to the greatest extent practical. Hazardous fuels reduction, site preparation and the use of prescribed fire for species habitat mitigation would be implemented in a manner consistent with ecosystem management objectives.

2.2.3 Cultural Resources

All archaeological sites discovered in the course of survey would be evaluated and protected by the BLM under the following Federal laws: Federal Land Policy and Management Act of 1976, National Historic Preservation Act of 1966, Antiquities Act of 1906, Archaeological Resource Protection Act of 1979, Reservoir Salvage Act of 1960, American Indian Religious Freedom Act of 1978, National Environmental Policy Act of 1960, American Indian Freedom Act of 1978, and Native American Graves Protection and Repatriation Act of 1990.

Adverse effects to archaeological/historical sites are most easily mitigated through site avoidance. Where avoidance is not possible, scientific study of the affected sites would mitigate anticipate damage. When there are conflicts between the need to mitigate damage to sites through excavation and the need to protect other values, adverse effects to sites could occur.

Pre-project cultural resource surveys would be conducted in areas where timber harvest, landings and new road construction are proposed. Buffer areas protecting archaeological sites would be installed for site protection.

2.2.4 Invasive Species and Port-Orford-cedar root rot

Heavy equipment would be washed before moving into the Planning Area to remove soil and plant parts to prevent the spread of invasive and noxious weeds and disease. Port-Orford-cedar is not found within the Planning Area.

2.2.5 Threatened, Endangered, & Special Status Wildlife Species and Habitat

The proposed sale is located in the Grave Creek watershed which is covered in the U.S. Fish and Wildlife Service's (USFWS) Biological Opinion (1-14-03-F-511) issued October 20, 2003. Informal consultation with the National Marine Fisheries Service (NOAA fisheries) for listed fish species would occur prior to issuing a decision.

2.2.5.1 Spotted Owls (threatened)

No treatments would take place in the 100-acre northern spotted owl (*Strix occidentalis*) activity centers. Trees within these areas would not be used for guy trees.

Spotted owl surveys, though not required, would be conducted in the spring of the year timber sale units would be logged to ensure owls are not present. All activities would comply with the U.S. Fish and Wildlife Service's Terms and Conditions and Project Design Criteria (Biological Opinion 1-14-03-F-511). Delay of project activities would occur if hatching year (fledgling) spotted owls are known or suspected within or immediately adjacent to a unit. As cited in the BO:

> (I) **Work activities** (such as tree felling, yarding, road construction, hauling on roads not generally used by the public, prescribed fire, blasting) that produce loud noises above ambient levels, or produce thick smoke that would enter the stand, will not occur within specified distances (sees table below) 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 1and 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. March 1 – June 30 is considered the critical early nesting period; the action agency biologist has the option to extend the restricted season to as late as September 30 during the year of harvest, based on site-specific knowledge (such as a late or recycle nesting attempt). The boundary of the 0.25-mile area may be modified by the action agency biologist using topographic features or other site-specific information (generally, a 126 acre area will be protected). The 0.25 miles is calculated as a radius from the assumed nest site (point).
>
> Broadcast burning (for site preparation) will not take place within 0.25 mile of known active northern spotted owl nests between March 1 and June 30 (or until two weeks after the fledging period).

Table 2- 1. 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

The distances presented in the above table would, at a minimum, affect the following units: #1-3, 1-7, 13-2, 13-3, 18-1, and 19-3. The restrictions mentioned above could be waived in a particular year if the wildlife biologist determines that spotted owls are not nesting or that no young are present that year.

2.2.5.2 Northern Goshawk (BLM Sensitive)

Limited surveys thus far have not found northern goshawks in the Planning Area. If a northern goshawk (*Accipiter gentilis*) nest is located, it would be protected with a 30-acre nest core area and no activity would be permitted within 1/4 mile of the nest between March 1-July 15, or until a biologist has determined that nesting is not occurring or that the juveniles have sufficiently dispersed.

2.2.5.3 Raptors

All special status raptor nests would be protected from project activities that are within ¼ mile that might disturb or interfere with nesting between March 1 and July 15.

2.2.5.4 Townsend big-eared bat (Special Status: BLM Sensitive)

Provide 250' buffer for timber harvest as specified in RMP (p. 47), and a 100' buffer for fuels treatment except in September, when the full 250' buffer would remain for all activities to protect swarming bats.

2.2.6 Special Status Plant Species and Habitat

Populations of special status plants would be protected with a 100 foot no-cut buffer, or to approved protocol, if available. Prescribed burns would not be planned within these buffers.

2.2.7 Snags and Down Logs

All regeneration or overstory removal harvest units would be guided by the "Guidelines for Snag and Down Wood Prescriptions in Southwestern Oregon" (White). The ROD provided for specific coarse woody measures to be developed (C-40). Where existing sites are currently below standard levels, 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 naturally occurring dead and down woody debris, greater than or equal to 16 inches diameter breast height (DBH) would remain on the site.

2.2.8 Fish/Streams/Riparian Habitat

All activities within riparian reserves would be consistent with the Aquatic Conservation Strategy of the Northwest Forest Plan and as amended (USDA/USDI 2003).

Informal consultation with the National Marine Fisheries Service (NOAA fisheries) for listed fish species would occur prior to issuing the decision record.

In accordance with the Medford District RMP and the Northwest Forest Plan (NFP), riparian reserve widths would be 150 feet (one site potential tree) on each side of non-fishery intermittent and perennial streams. On fish streams, the width would be a minimum of 300 feet (two site potential trees). Though none have been located at this time, riparian reserve width on springs and seeps would be 100 feet.

No logging, yarding or other activities, with the exception of fuels treatments, would occur within riparian reserves. There is no coho habitat adjacent to any harvest unit. Trees within one tree length of the riparian reserve are to be directionally felled away from the edge so tree felling would not impact these reserves.

Slashing in riparian reserves would be done no closer than 25' of streams; pile burning would not be within 25' of streams.

Underburning would not be within 50 feet of streams.

Trees in riparian reserves, owl core areas, and on timber production capability classification (TPCC) withdrawn land, that are accidentally knocked over during falling and yarding would be retained on-site for fish and wildlife habitat.

Helicopter refueling sites, including those located in riparian reserves (minimum of one tree length), would be operated to comply with all applicable regulations.

2.2.9 Timber Harvesting

Partial suspension would be required on all cable units to minimize soil compaction.

The number of yarding corridors would be minimized to reduce soil compaction from cable yarding. Landings and corridors would be located approximately 150 feet apart; lateral yarding would be required in all units.

A one full tree length buffer would be flagged from the unstable ground adjacent to units 18-2 and 18-7 and all activities such as falling and yarding would be away from the buffer area. Timber would be helicopter yarded to the existing road.

Landings would be located in approved sites, designed with adequate drainage. Step landings would be re-contoured following use. Helicopter landings would be constructed and used in the same season. The landings would be subsoiled (Davis 1990) following logging and planted with conifers. Exceptions would be where landings utilize existing road prisms, in which case the original roads would not be subsoiled. Dust abatement on landings would include rocking, lignin, or watering. Adequate drainage would be provided to minimize erosion. The 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 Glendale Field Manager and meet state and federal regulations.

2.2.9.1 Small Diameter Harvesting

All pieces to be removed would be 4 inches to 8 inches in diameter. Logs for removal would be no longer than 18 feet. Branches would be bucked prior to removal. Cable yarding would not be allowed between March 1 and June 1 to prevent bark slippage on residual trees.

Any woody material not removed to roads and still considered a hazard would be piled and burned. This slash material would be piled away from residual trees, covered in plastic sheeting and later burned to reduce fuel loading.

2.2.10 Transportation

Temporary roads would be built, used and decommissioned within the same operating season and would not be winterized. 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.

Permanent roads proposed under Alternative 2 would be outsloped.

New construction, decommissioning, normal road maintenance, road renovation, and log hauling would be restricted between May 15 and October 15 of the same calendar year. If the roads are deemed too wet, no hauling would be allowed unless approved by the Field Manager. Reasons to suspend hauling on non-paved roads include: water is flowing on the surface of the road or ditchlines and when loaded log tire deflection exceeds 2 inches in the road surface. 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.

Dust abatement using water, lignin or other approved methods would be implemented on haul roads to protect the fine materials in the road surface, as well as to reduce the dust which would affect local residents and other public users of the area.

Water drafting sites would be approved by the Authorized Officer and would be designed and used in ways to minimize adverse effects on stream and riparian habitat. Screening on intake pipes would meet NOAA Fisheries criteria to protect listed fish species.

Energy dissipators 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.

Culvert replacement work in live streams would be restricted to the period within June 15 through September 15 in accordance with Oregon Department of Fish and Wildlife (ODFW) instream work period guidelines.

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

Equipment refueling would be done within a confined area outside the stream channel such that there is minimal chance that toxic materials could enter a stream.

Flowing water would be diverted around each culvert replacement site whenever there is sufficient water volume and would be returned to the channel immediately downstream.

Remove as much soil as possible from the channel following culvert replacement.

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

Dirt, rocks and other material would not be side-cast within riparian reserves or where subsequent erosion would result in stream sedimentation. End hauling would be required where necessary to prevent adverse effects to streams. 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.

Road cuts, fill slopes, borrow material and other bare ground disturbed by road construction activities would be mulched and seeded prior to autumn rains.

2.2.11 Visual Quality

Visual resource management (VRM) objectives are broken down into four classes with management guidelines, Class I – Class IV. These four classes represent the amount of acceptable visual impact a given proposed activity may produce. Class I represents the highest visual standard and Class IV has the greatest amount of acceptable visual impacts.

Approximately one-half of the planning units fall within VRM Class II lands located within the foreground/middleground of the Interstate 5 corridor. Foreground/middleground is defined as land within one mile or to the first ridge of Interstate 5, whichever is closer. Management directives for VRM Class II lands are as follows:

> "Manage VRM Class II lands for low levels of change to the characteristic

landscape. Management activities may be seen but should not attract the attention of the casual observer. Changes should repeat the basic elements of form, line, color, texture, and scale found in the predominant natural features of the characteristic landscape" (RMP, p. 70)

The remaining planning units fall within VRM Class III and IV lands. Management directives are as follows:

> "Manage VRM Class III lands for moderate levels of change to the characteristic landscape. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements of form, line, color, texture, and scale found in the predominant natural features of the characteristic landscape" (RMP, p.70). Also VRM III is "BLM-administered land allocated to meet rural interface area (RIA) objectives unless lands within RIS's are already allocated to some other higher level of protection (e.g., W&SR, SRMA's, etc.)" (RMP/EIS, p. 2-41).

> "Manage VRM Class IV lands for moderate levels of change to the characteristic landscape. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the effect of these activities through careful location, minimal disturbance, and should repeat the basic elements of form, line, color, and texture" (RMP, p. 70).

Use of helipads within the viewshed of the Interstate 5 corridor, private residential lands, tourism sites, and rural roads would be minimized.

2.2.12 Rural Interface Area

Residents within 1/4 mile of helicopter units would be notified before helicopter activity begins in the area.

2.3 Alternatives

2.3.1 Alternatives Considered but Eliminated from Further Analysis

All potential harvest units were designated by looking at available GFMA lands of appropriate age. An Alternative that considered analyzing high priority red tree vole sites was deferred because the red tree vole has now been removed from the Survey and Manage species list and categorized as a Special Status Bureau Tracking species. Bureau Tracking species do not require protection. Specific units deferred during the analysis of this project are found under Appendix A.

2.3.2 Alternative 1 (No Action)

Under the No Action Alternative, the management actions described under the three action alternatives would not take place at this time. RMP related routine management

actions would continue to occur, including fire suppression, road maintenance and plantation maintenance. The opportunity for timber harvest and fuels treatments in this watershed would continue to be a viable option for future entries and analyzed through a separate environmental analysis.

Untreated areas in all alternatives would perpetuate current conditions and in many mature stands, growth and deterioration would increase fuel loading. These conditions over time would increase the potential for a stand replacement fire within or adjacent to the planning area. The action alternatives propose treatments to reduce fire hazard and decrease long-term adverse cumulative effects. This opportunity to reduce fire hazard would not occur under Alternative 1.

Because stand densities would remain unchanged, the trend to shade tolerant species would continue which would create a moderate increase in ladder fuels. As mortality continues in these stands, snag populations and down, woody fuels would continue to accumulate. Until a disturbance, such as fire, enters the stand this trend is unlikely to change. If a fire were to occur, rate of spread and flame length would be severe enough to prevent direct attack by hand crews. A wildfire would have the potential to cause a considerable amount of scorch and mortality of individual trees. The potential for a large fire to occur increases as the vegetation increases in density and becomes more continuous and homogeneous.

As the vegetation along roads grows due to the lack of maintenance and hazardous fuels treatments, access for firefighting crews would decrease. A decrease in road access and a simultaneous increase in fuel loading would increase the probability of a large, intense wildfire.

There would be no short-term addition of sediment to streams because there would be no road renovation. However, the beneficial long-term effects of reducing stream sedimentation by improving road drainage would not occur as they would under the action alternatives. 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. This would result in allowing some roads to continue to degrade and contribute sediment to important salmon, steelhead and cutthroat trout streams. No roads would be built or decommissioned.

2.3.3 Overview of the Action Alternatives (Alts. 2, 3, 4)

Table 2-6 summarizes silvicultural and fuels management prescriptions, projected harvest volumes, transportation management needs and logging systems for all units for each of the action alternatives. See Table 2-5 for unit by unit prescriptions for each of the three action alternatives. The accompanying maps, located at the end of this document, provide a geographic display of the harvest and road prescriptions under each of the alternatives.

Commercial thinning (CT). The desired future condition is a vigorous stand of "second growth" conifers exhibiting good tree growth, 80%+ canopy closure, scattered large "legacy" conifers, and a component of hardwoods, snags, and residual coarse woody debris (CWD). New snag and CWD recruitment would come from residual legacy trees and the residual conifers left after thinning. Commercial thinning within the VRM2 corridor would consider visual changes to the landscape.

The primary purpose of commercial thinning is to control existing stocking levels and increase and redistribute growth on the remaining trees to enhance stand yield and quality. While some stands within Five Rogues exhibit even-aged characteristics that appropriate for relative density comparisons, most of the stands are comprised of mixed ages (multiple cohorts) that reflect previous harvesting and/or historical fire intervals. Thinning from below removes the smaller less vigorous conifers. Leave trees should be the dominant, fast-growing conifers with healthy crowns, generally 30% or greater crown ratios.

Selective Cut (SC). This method harvests stands that are generally all aged with multiple canopy layers and overstocked in small or large portions of the unit. The objective of the selection cut is to modify the existing stand structure. This is intended to capture wood volume of suppressed conifers, overstocked portions of the stand to redistribute growth potential to the residual trees and in some instances, release conifer reproduction. Trees in all diameter classes are considered crop trees. Some discrimination among the immature trees must occur, such that the least healthy are harvested during the cutting cycle operations and the most vigorous are retained. Priority leave for large conifers are the largest and most vigorous, while meeting the objectives above.

Group Selection (GS). GS units are planned within VRM II lands to meet the objectives for low levels of change to the characteristic landscape. Management activities may be seen but should not attract the attention of the casual observer (RMP, p. 70).

The Desired Future Condition is an overstory of large conifers with ½ to 1 acre openings having a variety of age and size classes of conifers from seedlings to pole size with a component of hardwoods, snags, and residual course woody debris (CWD). These openings would imitate small openings often created in un-entered mature stands when small root rot pockets occur or from windthrow. New snag and CWD recruitment would come from residual legacy trees and the next stand of conifers would act as a replacement source for the legacy overstory trees as mortality occurs.

Regeneration harvest (RH). This method would harvest all merchantable conifers leaving 7 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" (RMP, p. 188). The leave trees should be spaced throughout the unit rather than clumped, unless it is determined they need to be clumped for habitat retention for a wildlife species of concern after wildlife surveys are completed. The desired future condition is a scattered overstory of these 7-10 large "legacy" conifers with well-stocked

understory of vigorous conifers, and component of hardwoods, snags, and residual course woody debris (CWD). For stands within connectivity/diversity blocks, retain 12-18 green conifer trees per acre.

New snag and CWD recruitment would come from residual legacy trees and the next stand of conifers would act as a replacement source for the legacy overstory trees as mortality occurs. The purpose of a regeneration harvest is to replace the existing mature stand with a new young even-aged stand within the guidelines of the RMP and Northwest Forest Plan.

Small Diameter Commercial Thinning
This treatment would thin the stand from below to reduce stocking and to harvest small diameter trees (smallwood) less than 8" dbh.

Fuels Treatments.
For all prescribed fire activities, a prescribed fire plan would be prepared that includes both resource and fire objectives. Fuel moisture and weather parameters would be developed based on these objectives. The timing of the burn would be based on achieving these objectives, occurrence of the parameters, predicted weather, and the availability of adequate fire suppression resources as a contingency plan in the event of fire escape. Prescribed fire effects can include mortality in both the overstory and understory vegetation.

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

2.3.4 Alternatives 2

Harvest treatments (alt 2)
Alternative 2 emphasizes timber harvesting as described under northern GFMA objectives in the Medford Resource Management Plan. However, specific project design features and the development and design of Alternative 2 by the interdisciplinary team have reduced the full amount of timber harvest allowed under the RMP. Many stands were deferred for treatment under this project (see Appendix A). Alternative 2 would harvest 58 units covering approximately 1,273 acres. The estimated product from harvest is 9-13 million board feet (mmbf) of timber. A summary of the proposed harvest units

and treatments is presented in Table 2-5. Locations of the units are shown on the attached maps (Appendix D).

Regeneration harvesting would occur (see table 2-6) on approximately 346 acres across 21 units. The target number of trees to be retained in GFMA areas would be 7-10 large conifers and 3 large hardwoods per acre, as well as snags and down logs to provide biological legacies and large structure. The actual number of trees retained would vary between units in order to provide additional coarse woody debris, where lacking, and additional shade on harsher sites. Regeneration harvest treatments include harvesting within connectivity/diversity blocks (units 17-1, 17-2, 29-1, 15S-4, 15S-6, 15S-7) and would retain at least 12-18 trees per acre (tpa) and would maintain 25-30 percent of each block in late-successional forest (RMP p. 40). Group Selection (GS) is also an even-aged regeneration harvest system and (units 18-1, 18-3) would consist of small openings, approximately ½ to 1 acre affecting approximately 7-10% of the total stand.

Commercial thinning (see table 2-6) would include approximately 821 acres within 30 harvest treatment units. The existing stands would be thinned to release the residual trees removing approximately 30% of the canopy. A small diameter thin (trees less than 8" diameter breast height) is proposed for unit 5S – 5. This smallwood harvest would maintain approximately 150 - 200 trees/acre.

Fuels Treatments (alt. 2)

Post-Harvest Fuels Management/Site Preparation

Activity slash created from timber harvesting would be slashed, handpiled and burned on approximately 1,273 acres (see Table 2-2). The proposed slashing, hand piling and burning fuel of created slash from timber harvest treatment units would be designed to remove approximately 50 to 75% of the fuel between 1 and 6 inches in diameter and greater than 2 feet in length. Hand piling and slashing of activity slash would be up to 7" diameter on the large end and not to exceed three feet in length. Fuel outside this size range would be left untreated. However, some smaller fuels would be included in the piles to create optimal ignition conditions.

Slashing of undamaged brush, hardwoods and conifers could be requested to meet hazardous fuels reduction and site preparation requirements. Typically, maintenance underburns would occur 2-7 years following the initial treatments but would be driven by the condition of the stand and regrowth of slashed vegetation. It is estimated that approximately 50% of the post harvest fuels units would be followed up by future maintenance under burns.

Table 2- 2. Summary of post-harvest fuels management/site preparation units for Alternative 2

Unit Number	Acres	Type of Treatment*		
		Slashing	Hand Pile	Pile Burn
1S-3	17	X	X	X
1S-4	28	X	X	X
1S-5	13	X	X	X
1S-7	14	X	X	X
3-1	30	X	X	X
5S-1	45	X	X	X
5S-2	18	X	X	X
5S-3	14	X	X	X
6S-5	14	X	X	X
9-1	25	X	X	X
9-2	4	X	X	X
13S-1	64	X	X	X
13S-2	47	X	X	X
13S-3	73	X	X	X
13S-4	10	X	X	X
15S-2	31	X	X	X
15S-4	30	X	X	X
15S-5	16	X	X	X
15S-6	7	X	X	X
15S-7	12	X	X	X
1-2	9	X	X	X
1-3	43	X	X	X
1-7	17	X	X	X
10-1	10	X	X	X
13-2	9	X	X	X
13-3	12	X	X	X
15-3	47	X	X	X
15-4	7	X	X	X
17-1	13	X	X	X
17-2	17	X	X	X
18-1	3	X	X	X
18-2	7	X	X	X
18-4	28	X	X	X
18-5	28	X	X	X
18-7	5	X	X	X
18-8	14	X	X	X
18-9	26	X	X	X
19-3	74	X	X	X
27-1	68	X	X	X
27-2	35	X	X	X
27-3	2	X	X	X
27-4	13	X	X	X
29-1	44	X	X	X
31-3	7	X	X	X
31-4	7	X	X	X
32-1	30	X	X	X
32-2	10	X	X	X
32-3	2	X	X	X

Unit Number	Acres	Type of Treatment*		
		Slashing	Hand Pile	Pile Burn
32-6	10	X	X	X
32-7	6	X	X	X
33-5	72	X	X	X
33-13	17	X	X	X
35-2	31	X	X	X
35-3	1	X	X	X
35-5	5	X	X	X
35-6	9	X	X	X
35-7	3	X	X	X
35-8	19	X	X	X
Total Acres	**1,273**			

* - Units would be re-evaluated prior to treatment to determine if prescribed treatment is still appropriate given current unit conditions

Fuel Treatment Units (alt. 2)

These treatments include existing stands planned only for fuels treatments. This would be in addition to treating created slash from harvesting listed under table 2-2. Fuels treatment within the Five Rogues Project would treat urban interface, hazardous fuel reduction and create defensible space for fire suppression efforts. Treatments within the Five Rogues Project area include slashing, hand piling, pile burning and underburning. As mentioned above, it is estimated that approximately 50% of the fuel treatment units would require underburning to maintain stand health and reduce fire hazards. Table 2-3 provides a summary of potential fuels treatments.

Table 2- 3. Summary of Fuels Treatments for Alternative 2

PROPOSED FUELS TREATMENT UNITS: New Fuels Treatment Units				
Unit Number	**Acres**	**Type of Treatment***		
		Slashing	**Hand Pile**	**Pile Burn**
1S-2	15	X	X	X
1S-6	17	X	X	X
15S-1	151	X	X	X
31-2	6	X	X	X
31-5	3	X	X	X
31-6	29	X	X	X
33-1	9	X	X	X
33-2	3	X	X	X
33-11	10	X	X	X
33-14	23	X	X	X
39-9	15	X	X	X
Total Acres:	**281**			

* - Units would be re-evaluated prior to treatment to determine if prescribed treatment is still appropriate given current unit conditions.

Transportation Management (alt. 2)

Approximately 2.35 miles of permanent roads and 0.75 miles of temporary roads would be built. The 2.35 miles of permanent road construction would reduce the turn-a-round distance a helicopter would have to fly during yarding operations to 13-2, 18-4 and 19-3. This road would also provide permanent access to unit 32-1. Approximately 0.60 miles of existing roads would be reconstructed, 0.85 miles would be decommissioned and 0.25 miles would be blocked. Approximately 61 miles of existing roads would be renovated. Renovation includes surface blading, ditch maintenance, roadside brushing, drainage improvement, spot rocking and culvert cleaning. Replacing a deteriorating and undersize culvert in mainstem Flume Gulch would restore passage for cutthroat trout and protect road integrity during peak flows. The description of treatments for individual road segments are displayed in Table 2-4 below.

Table 2- 4. Summary of road construction, renovation, drainage improvement, and closing for Alternative 2.

Road Number	Road Name	Length	Surface	Proposed	Haul
32-5-30	Swamp Cr	4.84	ABC	Renovate	5/15-10/15
33-5-7 A	Board Tree	2.23	PRR	Renovate	5/15-10/15
33-5-7 B	Board Tree	1.81	PRR	Renovate/ Drainage Imp.	5/15-10/15
33-5-10 A	Wolf Creek Rd.	0.24	ASC	Renovate	5/15-10/15
33-5-10.3 A	Wolf Creek	0.88	ASC	Renovate	5/15-10/15
33-5-17	Board Tree	0.60	PRR	Reconstruct; Gate after use.	5/15-10/15
33-5-18 A	Board Tree Sp	1.40	ASC	Renovate	5/15-10/15
33-5-30.3 A	Miller Mobile 1	0.87	PRR	Renovate	5/15-10/15
33-5-31	Miller Gu.	0.11	NAT	Renovate	5/15-10/15
33-5-31.2 A/B	Miller Mobile	0.96	ASC	Renovate	5/15-10/15
33-5-31.3 A/B	Miller Benjamin	2.40	ASC	Renovate	5/15-10/15
33-5-31.7	Miller Gu. S Sp	0.13	ASC	Renovate	5/15-10/15
33-5-32 A	Miller Gulch X	0.40	ASC	Renovate	5/15-10/15
33-5-32.1	Valley View	0.65	ASC	Renovate	5/15-10/15
33-6-10 A-F	Farmers Gulch	1.43	NAT	Renovate	5/15-10/15
33-6-10.1 A1	Rollercoaster	0.40	NAT	Renovate	5/15-10/15
33-6-10.2 A/B	Tunnel Ridge	0.82	NAT	Renovate	5/15-10/15
33-6-14 A/B	Wolf Orchard	0.75	ASC	Renovate	5/15-10/15
33-6-24	Miller Gulch	4.03	ASC	Renovate	5/15-10/15
33-6-26	Wolf Cr. Divide	2.70	GRR	Renovate	5/15-10/15
33-6-27	London Peak	0.80	GRR	Renovate	5/15-10/15

Road Number	Road Name	Length	Surface	Proposed	Haul
33-6-27.2	White Fang	1.35	GRR	Renovate/ Drainage	5/15-10/15
33-6-27.3	Jack's Spur	0.41	GRR	Renovate	5/15-10/15
33-6-27.4	Barleycorn	0.10	GRR	Renovate/ Decommission after use	5/15-10/15
33-6-27.5	Rd with no	0.20	NAT	Renovate	5/15-10/15
33-6-33	Flume Gu Sp	1.00	GRR	Renovate	5/15-10/15
33-6-33.1	Brush Gulch	0.62	GRR	Renovate	5/15-10/15
33-6-33.2A	Flume Gu Sp 2	0.33	PRR	Renovate	5/15-10/15
33-6-33.4	Flume Descent	0.25	GRR	Renovate	5/15-10/15
33-6-33.5	Flume Descent	0.25	GRR	Renovate	5/15-10/15
33-6-33.6	Flume Descent	0.40	GRR	Renovate	5/15-10/15
33-6-35	Mackin Quarry	0.20	PRR	Renovate	5/15-10/15
34-5-5	Miller Mobile	1.00	ASC	Renovate	5/15-10/15
34-5-6	Miller Gu. N	0.14	ASC	Renovate	5/15-10/15
34-6-1	Salmon Cr Sp	0.47	GRR	Renovate	5/15-10/15
34-6-1.1	Aiko-Aiko rd	1.50	GRR	Renovate	5/15-10/15
34-6-2 A-D	Salmon Cr	2.95	PRR	Renovate	5/15-10/15
34-6-3.1 A-B	Mackin Gulch	1.02	ASC/PRR	Renovate	5/15-10/15
34-6-3.1C	Mackin Gulch	0.55	PRR	Decommission	5/15-10/15
34-6-3.3 A	Mackin Ridge	1.56	ASC	Renovate/ Drainage	5/15-10/15
34-6-3.3 B	Mackin Ridge	0.40	NAT	Renovate	5/15-10/15
34-6-5 A-B	Flume Gulch	4.70	GRR	Renovate	5/15-10/15
34-6-5 C	Flume Gulch	0.80	NAT	Renovate Drainage	5/15-10/15
34-6-11.1 A-B	Copper Queen	2.60	ABC	Renovate	5/15-10/15
34-6-12 A	Burgess Gulch	0.62	ASC	Renovate	5/15-10/15
34-6-12 B-D	Burgess Gulch	2.90	ASC	Renovate	5/15-10/15
34-6-13	Sexton	1.49	ASC	Renovate	5/15-10/15
34-6-13.1A	Shorthorn Sp	0.41	ASC	Renovate	5/15-10/15
34-6-13.1B	Shorthorn Sp	1.00	NAT	Renovate/ Reblock after use	5/15-10/15
34-6-13.2	Burgess Sp	0.78	NAT	Renovate/ Reblock after use.	5/15-10/15
34-6-13.3	Burgess Sp	0.25	NAT	Renovate/ Reblock after use	5/15-10/15
34-6-15	Copper Queen S	0.62	NAT	Renovate	5/15-10/15
34-6-15.1	Copper Queen F	1.00	NAT	Renovate	5/15-10/15
Private Spur rd 1	None	1.00	NAT	Renovate/ Reblock after use	5/15-10/15
Private Spur rd 2	None	0.20	NAT	Renovate	5/15-10/15

Road Number	Road Name	Length	Surface	Proposed	Haul
33-6-27 Spur 1 seg. A	None	0.20	NAT	Renovate/ Decommission after use	5/15-10/15
33-6-27 temp spur	None	0.10	NAT	Decommission after use.	5/15-10/15
33-6-35 Pvt. spur	Heli-landing	0.10	NAT	Renovate	5/15-10/15
34-6-3.3 temp spur	None	0.10	NAT	Decommission after use	5/15-10/15
34-6-3.3 Temp spur	None	0.10	NAT	Decommission after use	5/15-10/15
34-5-5 Temp spur 1	None	0.10	NAT	Decommission after use	5/15-10/15
34-6-9 Temp. spur	None	0.35	NAT	Decommission after use	5/15-10/15
33-5-18 # 1 New	Ridge road	1.40	NAT	New Rd. Permanent	5/15-10/15
33-5-18 # 2 New	None	0.70	NAT	New Rd. Permanent	5/15-10/15
33-6-33 New rd.	None	0.25	NAT	New Rd. Permanent	5/15-10/15

Definitions:
BST Bituminous Surface Treatment
ABC Aggregate Base Course
ASC Aggregate Surface Course
GRR Grid Rolled Rock
PRR Pit Run Rock
NAT Native Surface

Grating (alt. 2)

Grating of open mining adits would occur on 5 sites located within the Planning Area for safety purposes.

2.3.5 Alternative 3. The main feature that separates Alternative 2 from Alternative 3 is that there would be no new permanent road construction (2.35 miles) under Alternative 3. This would also change the harvest yarding method from cable to helicopter on unit 32-1 (30 acres).

Harvest treatments (alt. 3) Alternative 3 is the same as Alternative 2 except for harvest yarding method from cable to helicopter on unit 32-1 (30 acres). See table 2.6

Fuels Treatments (alt. 3) Alternative 3 is the same as Alternative 2 for fuels treatments. See tables 2-2 and 2-3

Roads (alt. 3) Alternative 3 is similar to Alternative 2 except that there would be no new permanent road construction (2.35 miles). See table 2-4.

Grating (alt. 3)

Grating of open mining adits would occur on sites located within 34S, R6W section 15 for safety purposes.

2.3.6 Alternative 4.

This alterative responds to the issue of potential increased water flow from in the transient snow zone from regeneration harvesting. The adjacent private lands have been harvested heavily in the past. The main features that separate Alternative 4 from Alternatives 2 and 3 are that there would be less canopy removal in the Benjamin Gulch and Brushy Gulch drainages and that there would be no new permanent road construction (2.35 miles). As in Alternative 3, unit 32-1 would be helicopter yarded.

Alternative 4 would harvest 55 units covering approximately 1,227 acres. The estimated product from harvest is 8-12 million board feet (mmbf) of timber. A summary of the proposed harvest units and treatments is presented in Table 2-6. Locations of the units are shown on the attached maps (Appendix D).

Regeneration harvesting (see table 2-6) would include approximately 226 acres within 15 units. The target number of trees to be retained in GFMA areas would be 6-12 large conifers and 3 large hardwoods per acre, as well as snags and down logs to provide biological legacies and large structure. The actual number of trees retained would vary between units in order to provide additional coarse woody debris, where lacking, and additional shade on harsher sites. Regeneration harvest treatments include harvesting within connectivity/diversity blocks (units, 15S-4, 15S-6, 15S-7) and would retain at least 12-18 trees per acre (tpa) and would maintain 25-30 percent of each block in late-successional forest (RMP p. 40). Compared to Alternative 2 and 3, units 17-1, 17-2, 29-1 would be treated under a selective method compared to regeneration harvesting. Also units 5S-2, 5S-3 planned for regeneration harvesting under alt 2 and 3 woud be treated as fuels units and unit 6S-5 would be deferred. Units 32-2, 32-3, 32-6, 32-7 would maintain at least 60% canopy under Alternative 4 as opposed to leaving approximately 40-60% canopy under Alternatives 2 and 3.

In commercial thin (see table 2-6) units, the existing stands would be thinned to release the residual trees removing approximately 30% of the canopy. A small diameter thin (trees less than 8” diameter breast height) is proposed for unit 5S-5. This smallwood harvest would maintain approximately 150-200 trees/acre.

Fuels Treatments (alt. 4)

Post-Harvest Fuels Management/Site Preparation (alt. 4)

This Alternative is similar to Alternatives 2 and 3 except that unit 6S-5 (14 acres) would be deferred and units 5S-2 (18 acres) and 5S-3 (14 acres) would not be treated because the units are deferred from harvesting. Approximately 1,198 acres would be treated by slashing, hand piling, pile burning and potentially underburning. See table 2-1

Fuel Treatment Units (alt. 4)

This Alternative is essentially similar to Alternatives 2 and 3 except that two additional

fuels units 5S-2 (18 acres) and 5S-3 (14 acres) would be treated. Approximately 313 acres would be treated by slashing, hand piling, pile burning and potentially underburning in a future treatment. See table 2-2

This treatment would treat small-diameter conifers, hardwoods, and shrub species to reduce the high risk to high-intensity wildfire. Dense areas of conifers, under 7" diameter at breast height (DBH), would be thinned to various spacing (between 10 and 20 feet) leaving a mosaic of scattered groups of conifers. The slash from these operations would be hand piled and burned during the wet season. Hardwoods and shrubs under 7" DBH would be slashed, hand piled and burned with the conifer slash.

The objective is to reduce the fuel buildup in these areas, reduce ladder fuels, and release existing conifers to increase their growth rates.

Roads (alt. 4) Alternative 4 is similar to Alternative 3. See table 2-3.

Grating (alt. 4)

Grating of open mining adits would occur on sites located within 34S, R6W section 15 for safety purposes.

2.3.7 Comparison of Alternatives

Table 2- 5. Action Alternatives Harvest Treatments

Unit	ACRES	Alternatives 2 & 3		Alternative 4	
		RX	YARDING	RX	YARDING
1-2	9	CT	Heli	CT	Heli
1-3	43	CT	Heli	CT	Heli
1-7	17	Selective	Heli	Selective	Heli
1S-2	15	FUELS			
1S-3	17	Selective	Cable	Selective	Cable
1S-4	28	Selective	Cable	Selective	Cable
1S-5	13	REGEN	Cable	REGEN	Cable
1S-6	17	FUELS			
1S-7	14	Selective	Cable	Cable	Cable
1S-7	14	Selective	Cable	Cable	Cable
3-1	30	CT	Cable	CT	Cable
5S -1	45	CT	Cable	CT	Cable
5S-2	18	REGEN	Cable	FUELS	
5S-3	14	REGEN	Heli/cable	FUELS	
6S-5	14	REGEN	Heli	DEFER	
9-1	25	REGEN	Cable	REGEN	Cable
9-2	4	REGEN	Cable	REGEN	Cable
10-1	10	REGEN/GS	Heli/cable	REGEN/GS	Heli/cable
13-2	9	CT	Heli	CT	Heli

Unit	ACRES	Alternatives 2 & 3		Alternative 4	
		RX	YARDING	RX	YARDING
13-3	12	GS	Heli	GS	Heli
13S-1	64	CT	Heli/Cable	CT	Heli/Cable
13S-2	47	CT	Cable	CT	Cable
13S-3	74	CT	Heli/cable	CT	Heli/cable
13S-4	10	CT	Cable	CT	Cable
15-3	47	CT	Heli	CT	Heli
13S-4	10	CT	Cable	CT	Cable
15-4	6	CT	Heli	CT	Heli
1SS-1	151	FUELS			
15S-2	31	CT	Cable	CT	Cable
15S-4	30	Regen/OR	Cable	Regen/OR	Cable
15S-5	16	SMALL DIAMETER		SMALL DIAMETER	
15S-6	7	REGEN	Cable	REGEN	Cable
15S-7	12	REGEN	Cable	REGEN	Cable
17-1	13	REGEN	Heli	REGEN	Heli
17-2	17	REGEN	Heli	REGEN	Heli
18-1	3	REGEN/GS	Heli	REGEN/GS	Heli
18-2	7	REGEN/OR	Heli	REGEN/OR	Heli
18-4	28	REGEN	Heli	REGEN	Heli
18-5	28	CT	Heli	CT	Heli
18-7	5	REGEN	Heli	REGEN	Heli
18-8	14	REGEN/OR	Heli	REGEN/OR	Heli
18-9	26	REGEN	Heli	REGEN	Heli
19-3	74	CT	Heli	CT	Heli
27-1	68	CT	Cable	CT	Cable
27-2	35	CT	Heli/cable	CT	Heli/cable
27-3	2	CT	Cable	CT	Cable
27-4	14	CT	Cable	CT	Cable
29-1	44	REGEN	Cable	Selective	Cable
31-2	6	FUELS			
31-3	7	Selective	Cable	Selective	Cable
31-4	7	Selective	Cable	Selective	Cable
31-5	3	FUELS			
31-6	29	FUELS			
32-1	30	REGEN	Cable	REGEN	Cable
32-2	10	CT	Cable	CT	Cable
32-3	2	CT	Cable	CT	Cable
32-6	10	CT	Cable	CT	Cable
32-7	6	CT	Cable	CT	Cable
33-1	9	FUELS			
33-11	10	FUELS			
33-13	17	CT	Cable	CT	Cable
33-14	23	FUELS			
33-2	3	FUELS			
33-5	72	CT	Cable	CT	Cable
35-2	31	CT	Heli	CT	Heli
35-3	1	CT	Heli	CT	Heli
35-5	5	CT	Heli	CT	Heli

Unit	ACRES	Alternatives 2 & 3		Alternative 4	
		RX	YARDING	RX	YARDING
35-6	9	CT	Heli	CT	Heli
35-7	3	CT	Heli	CT	Heli
35-8	19	CT	Heli/Cable	CT	Heli/Cable
35-9	15	FUELS			

Totals

Table 2- 6. Summary of Specific Harvest Features by Alternative

Specific Features	Alternatives		
	2	3	4
Timber Harvest Levels			
Units Treated	58	58	55
Acres Treated	1,273	1,273	1,227
Volume Harvestable (MMBF)	9-13 mmbf	9-13 mmbf	8-12 mmbf
Regeneration Harvest/ Group Select			
Units Treated	21	21	15
Acres Treated	346	346	226
Range in Unit Size (Acres)	3-44	3-44	3-30
Commercial Thinning:			
Units Treated	30	30	30
Acres Treated	821	821	821
Range in Unit Size (Acres)	1-74	1-74	1-74
Selective Harvest			
Units Treated	6	6	9
Acres Treated	90	90	164
Range in Unit Size (Acres)	7-28	7-28	7-44
Small Diameter			
Units Treated	1	1	1
Acres Treated	16	16	16
Fuels Treatments			
Units Treated	11	11	13
Acres Treated	281	281	313
Road Work:			
Perm(Miles)	2.35	0	0
Temp. Minimum Roads (Mi.)	0.75	0.75	0.75
Renovation (Miles)	61	61	61
Reconstruction	0.60	0.60	0.60
Decommission	0.85	0.85	0.85
Blocking	0.25	0	0
Gates	2.7	0.6	0.6
Harvest Methods (Acres)			
Cable	728	728	703
Helicopter	529	529	508

Chapter 3 - Affected Environment

3.1 Introduction

This chapter describes the existing resource components within the proposed Five Rogues Project Area that might be affected by the management actions. The information in this chapter would serve as a general baseline for determining the effects of the Alternatives under the Environmental Consequences (Chapter 4) section of this document.

3.2 Location

The location of the Proposed Action

Analytical Watershed (fifth field):	Grave Creek
Project Area (sixth field watershed):	Wolf Creek, Grave Creek/Sunny Valley and Grave Creek/Placer 6th field watersheds
County:	Josephine and Douglas

Legal Description: T.33S., R.05W., Sections 5, 6, 7, 8, 17, 18, 19, 20, 29, 30, 31, 32; T.33S., R.06 W., Sections 1, 2, 3, 10, 11, 12, 13, 14, 15, 16, 21, 22, 23, 24, 25, 26, 27, 28, 29, 32, 33, 34, 35, 36; T.34S., R.05W., Sections 5, 6, 7, 8, 18, 19; T.34S., R.06 W., Sections 1, 2, 3, 4, 5, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 22, 23, and 24.

Table 3- 1. Critical Elements by Alternative. The following elements of the human environment are subject to requirements specified in statute, regulation, or executive order and must be considered in all EAs (BLM NEPA Handbook [H-1790-1]). (Y) = yes, the resource is present and affected. (N) = the resource is not present or affected.

Resource or Issue Affected by Alternative	**Alternative (Y or N)**				**Resource Affected by Alternative**	**Alternative (Y or N)**			
	1	**2**	**3**	**4**		**1**	**2**	**3**	**4**
Air Quality	Y	Y	Y	Y	Threatened & Endangered Species	Y	Y	Y	Y
Area of Critical Environmental Concern (ACEC)	N	N	N	N	Wastes, Hazardous/Solid	N	N	N	N
Cultural	N	N	N	N	Water Quality	Y	Y	Y	Y
Farmlands, Prime/Unique	N	N	N	N	Riparian Zones	N	Y	Y	Y
Flood plains	N	N	N	N	Wild & Scenic Rivers	N	N	N	N
Native American Religious Concerns	N	N	N	N	Wilderness	N	N	N	N
Invasive Species	Y	Y	Y	Y	Environmental Justice	N	N	N	N
Energy	N	N	N	N					

*Non-Critical Element

3.3 Fire and Fuels

The Grave Creek Watershed Analysis (WA) describes historic fires and sources of ignition (p. 70-72) and defines High Hazard Areas, High Risk Areas, and High Value Areas (p. 45-47). Map #12 in the WA shows the High Hazard Areas that exist within the watershed. Map #13 incorporates all three criteria to develop "High Priority Fuels Management" areas.

Fire History

Fire has been a normal occurrence in the Five Rogues Planning Area. Fire frequency in southern Oregon has been reported to range from less than three years more than to 200 years. While it is not possible to determine the exact fire frequency for the Planning Area without an extensive site specific field study, it is most likely averages about 50 years with hot, dry south faces being more frequent and cool, wet north faces probably greater than 100 years. In the watershed, it appears that fires were probably more frequent and more intense in the hot, low elevation areas than along the upper ridges where conditions are generally cooler and there is more moisture.

Historical natural fires in the watershed most frequently began in mid-summer and could continue to burn until autumn rains fell in October or November. With an extended time period to burn fires could cover large areas. Where high intensity fires did occur, they often reset the vegetative stand age to zero. Soils were left vulnerable to severe erosion due to loss of vegetation and organic matter.

Most fires were characterized by patchy, mosaic patterns, with areas of intense fire that killed overstory trees. The fires, however, were dominated by areas of low intensity underburns where only occasional trees or small patches of overstory trees were killed. Repeated, high intensity fires are revealed by the absence of older conifers on some sites that are now occupied by hardwoods. Evidence of low intensity fires can be seen in many older conifer stands.

South-facing slopes typically experience a higher intensity of fire disturbance than north facing slopes. Large conifers on south-facing slopes generally have a patchy distribution, as compared to the north-facing slopes, which often have a more continuous canopy of larger coniferous trees.

Historically, lightning was the most common source of ignition in this watershed. Due to the low summer precipitation and increased lightning frequency, July, August, and September were the months of greatest ignition activity. Miners were a source of intentional fire ignition. Areas were burned to open ground for mineral exploration and mining. Native Americans were also a source of intentional ignition in this area prior to European settlement. Burning was employed by Native Americans to encourage the resprouting of tanoak and to control pest populations. In addition, this practice cleared the ground under trees, which made hunting and gathering seed and acorns easier. Native Americans also burned along ridge tops to maintain travel corridors and openings for the production of hazel and beargrass, which were used for basket material one or two years after the site was burned.

The potential for stand-replacing fires in this area has increased due to fire suppression activities that began around the turn of the century. Fire suppression has allowed an increase in dense vegetation in young and mature forest stands. Historic lightning fire data within this area indicate that fires ranged from less than an acre to more than 2,000 acres. The density of this vegetation has created ladder fuels which have the potential to carry fire into forest canopies, increasing the risk of severe fire behavior. These types of fires make wildland fire suppression efforts difficult.

The following table lists fires that have occurred within the Grave Creek watershed since 1947.

Table 3- 2. Recent Fires within the Grave Creek Watershed

Name	Year	Acres
MERLIN LUMBER	1947	37
GREENBACK #1	1951	251
RATTLESNAKE CREEK	1951	1360
LAST CHANCE #1	1952	97
BUTTE CREEK 1	1955	123
WATER TANK GULCH	1956	27
FOLEY GULCH	1963	65
PLACER	1964	70
BRUSHY GULCH II	1970	10
GRAVE CREEK	1978	2900
PLEASANT CREEK	1987	1240

Fire Suppression and Management

Fire suppression efforts began in the early 1900s but effective suppression in the area did not occur until after World War II. With the advent of roads into the area, combined with adequate personnel, suppression efforts became more effective.

Fire control has reduced the occurrence and the number of acres burned. Current fire management still involves suppression of wildfires, both human-caused and natural ignitions. However, fire management has taken on several new directives that focus on fire prevention. Forested areas that are currently harvested on federal land usually receive some prescribed fire treatment, ranging from broadcast burns to hand-piling excess woody material that can not be sold for firewood, followed by pile burning.

Current Fuel Characteristics

Three factors were used to assess fuels and the potential for fires:

Fuel hazard - the capability of fuels to carry a fire
Fire risk - the probability of ignition
Value - the relative potential for resource loss from a fire.

Fuel hazards were analyzed based on fuel models of different vegetation types. The highest hazard was related to brushy, light fuels and ladder fuels**.**

There were several aspects of high fire risk, including: ridge tops, where the probability of lightning strikes are highest, the major access roads which receive the most vehicle use, the I-5 corridor, and the areas adjacent to private residences.

The following areas were considered high value:
-spotted owl core areas
-private residences and wildland urban interface areas

The Planning Area is primarily composed of a checkered board pattern of BLM lands and blocks of non-federal lands. These lands are considered high hazard and high risk because of the presence of potential ignition sources and the light flashy fuels. Many of these pieces of private land have been logged in the past several years with no subsequent slash reduction treatment.

3.4 Air Quality

Two designated air quality areas (defined by the Oregon Department of Environmental Quality) might be affected by management activities within the Planning Area. The Grants Pass non-attainment area is approximately 10 miles south. The Medford/Ashland non-attainment area is approximately 35 miles south of the watershed.

Air quality and visibility monitoring sites do not exist in the immediate vicinity where treatments would occur, therefore, existing air quality information is not available. Generally speaking, air quality is excellent since there are no stationary sources of particulate matter production.

When burning under spring-like conditions, larger fuels are not consumed due to higher fuel moisture. Fuel consumption is lower, creating fewer emissions, with smoke dispersal easier to achieve under general meteorological conditions. Ignition techniques, such as aerial firing, further reduce total emissions by accelerating the ignition period and reducing the total combustion process due to the reduction in the smoldering stage. Hand piling of slash allows selective burning of woody debris during late fall and winter but only under weather conditions that allow desired smoke dispersion. These mitigation measures can be used to bring emissions below levels required in the Clean Air Act.

3.5 Cultural Resources

Ethnographic/Archaeological Background

Ethnographic divisions in southwestern Oregon have been based on linguistic data. According to this information the Planning Area is located within the homelands of two distinctive modern day cultural groups: the Cow Creek Band of the Umpqua Indians and the Confederated Tribes of the Siletz and the Grand Ronde. The Siletz (Takelmas) lived along the north bank of the Rogue River, held part of the Rogue Valley and the Illinois watershed, and had villages to the north into the hills from which drain Wolf, Grave, Jump Off Joe, and Cow creeks. The territory of the Cow

Creek Band of the Umpqua Tribe had its northern perimeter near the mouth of Myrtle Creek and extended south into the Coast Range to include the entire watershed of Cow Creek.

The Takelma and the Cow Creek lifeways are best described as hunter, fisher, gatherer taking advantage of local and seasonal resources. Both tribes participated in harvesting salmon and lamprey eel, hunting game, and gathering seeds, nuts, and berries on a seasonal basis starting in a pattern referred to as an annual round. Takelma and Cow Creek women collected and prepared camas, acorns, and huckleberries. Ethnographic literature describes a settlement and subsistence centered around small permanent villages typically located on the terraces above major waterways with seasonal round expeditions into the surrounding uplands.

Historic Background

Inland regions of southwestern Oregon were not explored until 1827 when fur trapping expeditions led by Peter Skene Ogden of the Hudson's Bay Company traveled through the Project Area. This initial exploration was followed by Alexander McLeod in 1829. In 1836 Fort Umpqua became the first non-Indian settlement in the region and the southernmost station of the Hudson's Bay Companies extensive post system.

In the fall of 1841 a major exploration party passed through the Umpqua, Rogue, and Klamath areas with hopes of prospecting a wagon road. Lt. George Emmons commanded a field detachment that included experts in geology, linguistics, cartography, botany, and navigation. In 1846 Jesse and Lindsay Applegate were surveyors who were originally from the Willamette Valley were determined to find a new emigrant trail Oregon. In 1846 the southern emigrant road was created. This route became known as the California-Oregon Trail (Applegate Trail). The trail came from the north and headed south and served as a stock trail for cattle, sheep and horses to and from pasture and market. In 1857 a grant of $30,000 was allocated to build a military wagon road from Myrtle Creek to Camp Stuart. Construction began on this road in 1858 thus establishing a permanent north south route through southwestern Oregon.

In 1860 the Oregon-California stage line used the route of the Applegate Trail that the gold miners, emigrants and fur seekers first used. The stage line operated between Portland and Sacramento. Its purpose was to supply Ft. Lane with supplies and military personnel to quell the Native American uprisings in the Rogue Valley. On October 20, 1872 the first railroad arrived in Roseburg and after many delays and bankruptcies in 1882 the line was continued south from Roseburg.

From about 1922-24 the Pacific Highway was extended south through Drain, Oakland, Sutherlin and Galesville into the upper Cow Creek valley. This highway ran 97 miles through Douglas County connecting the largest major north-south west coast highway system of it's time.

In the 1960's Interstate 5 construction was completed through the project area and provided a link to the United States interstate highway system.

Along with the transportation systems bi-secting through the Planning Area gold mining became another important factor in changing the region. Mining began in southwestern Oregon in 1850

with the discovery of gold along the Illinois River near the mouth of Josephine Creek. Areas in Josephine County began producing large amounts of gold. A large mining district was established in the project area, named the Greenback-Tri-County mining district around the turn of the century. Large mines such as the Greenback Mine, the Columbia Placer, the Grave Creek Mine and the Daisy Mine were some of the larger mines either in the Planning Area or just outside of the Planning Area. Rich placer deposits within stream channels were the first to be hydraulically mined in the 1870's. Lode mining, which is underground mining using horizontal adits developed more slowly during the late 1870's and 1880's.

A limited archaeological survey of the Planning Area was performed by the BLM before 1995. This survey consisted of small project (less than 10 acre) surveys covering only a small portion of the Planning Area. However, in 1995 the BLM contracted with Cedar Research Inc. for a cultural resource survey to satisfy section 106 requirements in the High 5 Low 5 timber sale. This cultural resource survey covered 286 acres and recorded one new archaeological site and one prehistoric isolate. The newly recorded sites were evaluated and recommendations were written for their protection.

In the fall of 2003 a cultural resource survey was conducted and completed by BLM for the Five Rogues project area. The historic site types recorded on this survey include: mines, mining features, historic cabins, early transportation features, and railroad tunnels. Prehistoric site types included isolate flaked stone tools. Comparison with both recorded sites in adjacent watersheds and ethnographic literature revealed a consistency of pre-survey expectations regarding number of sites discovered and types of sites discovered.

3.6 Invasive Species

Scotch Broom (*Cytisus scoparius*) is a no-native species found in the Planning Area. The Glendale Resource Area noxious weed removal program treated this invasive species adjacent to Unit 15S-5 in 2003. This species is present in large numbers in the Grave Creek watershed on poor and exposed soil areas.

Bull thistle (*Cersium vulgare*), meadow knapweed (*Centaurea pratensis*), and other knapweeds occur in small amounts at this time along the edges of BLM roads in the project area.

3.7 Threatened, Endangered, & Special Status Wildlife and Habitat

Late-Successional Habitat Characteristics

The current late-successional habitat characteristics within the analysis area are representative of conditions throughout much of the Grave Creek watershed. These characteristics developed through a combination of factors, including historic vegetative conditions prior to European settlement, exclusion of fire, and logging activities during the twentieth century. Historically, it is thought that late-successional habitat was more extensive than the current condition (USDI 1999, p.44), probably occurring in a much more contiguous pattern, with some areas in open meadows and sparse conifer cover, most likely in low-lying areas along Grave and Wolf Creeks. As a result of road construction near main travel routes and communities, access to timber

harvest was provided many decades ago. In recent decades harvest has been occurring in areas farther away from these travel routes. Some of the historic late-successional habitat has also been the subject of partial cutting, resulting in a more open overstory with scattered large trees and an understory with a mixture of hardwoods and younger conifers. Additional natural occurrences, including past fires, insects, disease pockets, wind damage and soil characteristics, have further contributed to open overstories. As a result, some stands have developed a dense brush component with little conifer regeneration.

A key aspect of late-successional habitat value concerns the distribution of remaining habitat. Within the Grave Creek watershed and the Planning Area, many of the late-successional stands are highly fragmented and frequently isolated from other stands both because of past logging practices and checkerboard ownership patterns (USDI 1999, p. 51). In the Planning Area, there are two large blocks of late-successional habitat, including the approximately 1,200 acre Board Tree drainage, and the approximately 1,000 acre Burgess Gulch drainage, with a third small portion of a large 2,500 acre area near Reuben Creek. Within the Grave Creek watershed, late-successional habitat is concentrated in the eastern and western thirds. The center of the watershed, the Planning Area, is characterized by more agricultural and residential areas, along with the towns of Sunny Valley and Wolf Creek, and Interstate 5, and is dominated by the wide floodplain of Grave Creek. As a result, conditions in the Planning Area act as a barrier to east-west connectivity of late-successional affiliated species.

The riparian habitat in this watershed provides the greatest structural diversity of all the seral stages, and is currently estimated to constitute approximately 19,893 acres, or 40 percent of the lands in federal ownership (USDI 1999, p. 16).

There are three connectivity blocks in the Planning Area: one at the extreme northern end, T33S, R6W, S1, currently estimated to have 59% of federal land in late-successional habitat; one in the northeastern sector, T33S, R5W, S17, estimated to have 86% of federal land in late-successional habitat; and one in the southernmost portion of the Analysis Area, T34S, R6W, S15, estimated to have 78% of federal land in late-successional condition.

Northern Spotted Owl (threatened)

There are six northern spotted owl Activity Centers in the Planning Area. Five of these six nest sites were identified prior to the signing of the Northwest Forest Plan (NFP), and thus have 100-acres identified to be managed for late-successional characteristics. These Activity Centers (A.C.'s) include Sourdough Glen (A.C.#2215), Board Tree West (A.C.#0878), Foley Glen (A.C.#0917), Wolf Creek (A.C.#2624), Colby (A.C.#2618), with an additional activity center located after the signing of the NFP, known as Big Windy (A.C.#2280), which does not receive a 100-acre late-successional core area. An activity center is considered viable if there is at least 40 percent of the area within the 1.3 mile home range in a suitable habitat condition. Suitable habitat generally consists of stands with trees greater than 21"dbh with 60 percent or greater canopy closure. In the Planning Area, only two of the activity centers are in viable condition, with the other sites less stable and less productive, further indicating a relatively sparse late-successional condition in the Planning Area.

Northern Spotted Owl Critical Habitat

Critical habitat for the northern spotted owl is designated under the Endangered Species Act. The Planning Area includes approximately 2,600 acres of federal lands within Critical Habitat Unit #OR-32. This Unit coincides with the Rogue-Umpqua Area of Concern, which provides an essential link in connecting the Western Cascades Province with the southern portion of the Coast Ranges and the northern end of the Klamath Mountains Province (BA, Appendix B-2 USDA/USDI 2003). This unit provides the single link from the Western Cascades Province to the Klamath Mountains Province and associated Area of Concern, and due to checkerboard land ownerships, there is a heightened importance in maintaining high quality late successional habitat to provide critical landscape linkages.

Marbled Murrelets (threatened)

Over 600 marbled murrelet surveys have been conducted in the Glendale Resource area, including portions of the Grave Creek watershed, with no detections of murrelets (USDI 2000). The results of these surveys, and additional surveys on the Siskiyou National Forest, coupled with a statistical modeling and field-sampled method entitled the Southwest Oregon Inland Survey Assessment for Marbled Murrelets, have resulted in concurrence by the U.S. Fish and Wildlife Service that the far inland zones, beyond the transition from the hemlock zone to the conifer/mixed evergreen zone, which includes the entire Planning Area, no longer need to be surveyed for marbled murrelets (USDA/USDI 2003, Appendix H-2).

Marbled Murrelet Critical Habitat

The entire Planning Area is outside designated marbled murrelet critical habitat.

Bald Eagles (threatened)

There are no known bald eagle nest sites within the Planning Area. The nearest known bald eagle nest site is located adjacent to Galesville Reservoir, approximately eight miles northeast of the eastern boundary of the Planning Area.

Special Status Species

During the analysis of this project, all of the survey and manage species identified under the NFP were re-analyzed under the *Final Supplemental Environmental Impact Statement To Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines* (FSEIS, 2004 and ROD, 2004). Many of these species were than categorized under BLM Special Status Species designation as either Bureau Sensitive, Assessment or Tracking. Red tree voles, for instance were categorized as a Bureau tracking species requiring no protection.

Northern Goshawk (Special Status: BLM Sensitive)

Goshawks might nest in the Planning Area, but there are no known nest locations at this time. However, the nearest nest is only approximately two miles west of the western portion of the

Planning Area. Goshawks generally nest in the largest, oldest tree stands in the area, with foraging occurring in a variety of age classes because this large raptor preys on several larger species such as squirrels and grouse.

Great Gray Owls (Special Status: BLM Sensitive)

Great gray owls nest in late successional forests and forage in meadows and fields. The Planning Area had one detection of a great gray owl, in the southernmost portion, with no confirmation of a known nesting site. A second year of surveys for this species is planned in the spring of 2004 to meet standards for survey protocols.

Townsend's big-eared bats (Special Status: BLM Sensitive)

Townsend's big-eared bats are known to use mines, and have been located at the Copper Queen mining site in the southernmost portion of the Planning Area.

Western Pond Turtles (Special Status: BLM Sensitive)

Western pond turtles are found in the Planning Area and are listed as Bureau Sensitive in Oregon. These reptiles inhabit ponds and slow-moving water in the forested matrix within the Planning Area, including portions of Grave, Wolf, and Coyote Creeks.

Fishers (Federal Candidate Species for Threatened & Endangered Listing and Special Status -Sensitive)

Fishers are secretive small mammals which are candidate and Bureau Sensitive species, found to be warranted for listing under ESA in 2004, but precluded due to other USFWS priorities. Fishers have been found approximately ten miles southwest of the analysis area boundary, once with remote camera surveys and a second time with a visual observation. (Kerwin 2004b). Remote camera surveys initiated to protocol (Zielinski 1995) since 2001 have thus far failed to detect this species in the Grave Creek watershed, although the proximity of fisher observations and potential habitat suggest fishers may be present in the general area.

Fishers are associated with closed canopy forest in late-successional forests throughout its range in the Western United States, often associated with riparian areas (Buck 1983, Aubry and Houston 1992, Dark 1997, Golightly et al 1997). Zielinski et al 1996, 1997 found overhead cover associated with fisher locations. Jones and Garton (1994) noted that fisher did not use non-forested lands (<40% cover). Powell and Zielinski (1994) generalized an average home range for fishers as 40 and 15km^2 for males and females respectively, although individuals can range long distances (5-6km) in a single day. Home range calculations are difficult to estimate due to this tendency. Females use cavities in large diameter trees, documented from 56cm in Idaho (Jones 1991) to an average of 67cm in the southern Sierra (Zielinski et al 1996) for pups, and are known to move the young periodically. Dark (1997) found fisher detections negatively associated with traffic. 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 (USDA/USDI 1994, Appendix J-2,). Golightly (2004) speculates that associates showing fisher

as a late seral "obligate" may be more an artifact of attributes of later seral forests; lack of roads, large blocks of closed canopy, and minimized human influence.

As stated previously, fishers appear to have an affinity for riparian habitats and large downed wood. Approximately 40% of the federal ownership in this watershed includes riparian reserves, which provide the greatest amount of structural diversity of all seral stages. Two surveys of downed wood in the watershed (USDI 1999, p. 45) indicate that natural levels of large woody debris may be quite low, below the 120' per acre of Class 1 or 2, 16" in diameter.

3.8 Special Status Plant Species and Habitat

The Grave Creek Watershed Analysis (p. 44) describes the distribution of the late-successional habitat in the Grave Creek watershed as a function of the existing vegetative conditions before European settlement, the exclusion of fire, and the logging practices that have occurred since that time. While historical late-successional stands of conifers were considered to have been more contiguous, the Planning Area also includes small natural meadows and approximately 600 acres of low productive serpentine soil to the east of Sunny Valley. Serpentine soils promote sparse conifer stands of Jeffrey pine and incense-cedar which are tolerant of the toxic metals found in this geologic type.

Clearcutting has removed most of the late successional stands on private lands. There are younger even-aged stands that have developed from past clearcutting on BLM lands prior to implementation of the Northwest Forest Plan in 1994. The cutting of large trees on BLM lands are now limited to northern general forest management areas with further restrictions within connectivity blocks. This has allowed partial removal, shelterwood and regeneration with leave tree harvesting more recently on BLM lands. This has resulted in open overstories of stands with varying layers of understory

Special Status, Survey and Manage, Threatened or Endangered Vascular Plants

Vascular plant surveys were conducted in the spring of 2003, and nonvascular surveys were conducted during the fall of the same year.

Fritillaria gentneri, Limnanthes flocossa ssp. *grandiflora, Arabis macdonaldiana,* and *Lomatium cookii* are listed as Endangered under the Endangered Species Act. *Fritillaria gentneri* has been found in the Glendale Resource Area, and the Planning Area is within its range, as determined by the US Fish and Wildlife Service. However, it was not found in timber sale surveys for this project. The three remaining species, *L. flocossa* ssp. *grandiflora*, *Arabis macdonaldiana*, and *L. cookii* have not been found in the Glendale Resource area, and their ranges, as determined by the USFWS, do not extend into this geographic vicinity.

Camassia howellii and *Cypripedium fasciculatum* are Bureau Sensitive species, and are found in different habitats. *Camassia howellii* grows on mostly open sites, which exhibit at least some degree of serpentine influence. Although *Cypripedium fasciculatum* is typically found on north-facing slopes with a mature conifer canopy, there are documented populations of *C. fasciculatum* growing in the middle of old regen units. Neither species requires an interior forest microclimate

or old growth conditions. *Camassia* is often found growing in full sun, and was observed to resprout after an early spring (March 3) burning project in the Coyote Creek Junction Fuels Reduction Project. Subsequent monitoring visits to this project area indicate *C. howellii* (as well as *Silene hookeri var. bolanderi* and various other herbs) respond positively to the re-introduction of fire.

Silene hookeri var. bolanderi and *Delphinium nudicaule* are Bureau Assessment species which inhabit a variety of habitats, ranging from open woodlands and forest edges to open, exposed habitats influenced by serpentine soils. Neither of these species requires an interior forest microclimate, or old growth conditions.

Allium bolanderi var. *mirabile* and *Cypripedium montanum* are Bureau Tracking species and do not require protection. *Allium bolanderi var. mirabile* often grows on relatively barren sites, as well as in forested areas which exhibit a sparse understory layer. *Cypripedium montanum* is typically found in more forested habitats.

Special Status, and Survey and Manage Non-vascular Plants - Lichens, Bryophytes and Fungi

Surveys were completed in the fall of 2003 for lichens and bryophytes using existing protocols. The following non-vascular plant species were found within the planning area.

Table 3- 3. Non-Vascular Plant Species and Status.

Species name	Status	Habitat
Crumia latifolia	BAO	
Fissidens grandifrons	BTO	On larger rocks in streambeds
Funaria muhlenbergii	BAO	Rock outcrops
Hedwigia detonsa	proposed for special status	

3.9 Fish/ Streams/ Riparian Habitat/Soils

Watershed Condition

Land ownership is intermingled, owned by BLM, timber companies and private individuals. Less than 50% of the acreage in the Planning Area is under BLM management. Much of the land that is occupied by small farms and residences in the Grave-Placer, Grave-Sunny Valley and Wolf Creek HUC 6 watersheds are situated on or adjacent to historic floodplains. Most activities on these lands are agricultural (primarily hobby farms and livestock grazing). The majority of private lands in the HUC 5 have been tractor logged within the last 50 years resulting in soil compaction and erosion. Much of the tractor logging and log hauling from private lands takes place throughout the year and results in stream sedimentation, especially during winter months. It is expected that ground disturbance on private lands would continue.

There has been considerable timber harvest activity in these three HUC 6 watersheds in the recent past (Table 3-5); most of it on private lands. Some of it has been in the transient snow

zone, lands above approximately 2500 feet elevation. Six to 46 percent of each HUC 6 watershed is in the transient snow zone, generally above 2500 feet elevation. Watersheds with open forest canopy in the transient snow zone, especially when the TSZ comprise more than 50% of the watershed acres, are more susceptible to accelerated runoff and higher peak flows from rain-on-snow events than are same size watersheds at lower elevation where precipitation usually falls as rain, rather than snow. Hydrologic risk factors such as percent of each HUC 6 in TSZ, percent of acreage less than 30 years of age following most recent disturbance (generally wildfire or timber harvest), as well as road density (Table 3-4) and stream channel condition are used to evaluate the risk of rain-on-snow events. Rain-on-snow events could potentially destabilize stream channels and degrade habitat for fish and other aquatic species.

Acres that have been disturbed by logging or wildfire since 1974 in each of the three HUC 6 watersheds are in various stages of vegetation regrowth and hydrologic recovery (Table 3-5). Vegetation is considered to be in an advanced stage of hydrologic recovery 20 years after disturbance and substantially complete by age 30 (Harr 1989; Jones 2000). Analysis of satellite imagery for disturbance to the forest canopy in the project area for the period of 1974 to 2002 (28 years) strongly suggests that most vegetation is functioning at its hydrologic potential, because 73 to 80% is at least 28 years of age (Table 3-4). However, when numerous other factors are considered (i.e. water quality, stream habitat, channel condition, flow characteristics and other watershed features), the Grave-Sunny Valley, Grave-Placer and Wolf Creek 6th field watersheds are functioning below potential (functioning-at-risk), primarily because of past and current human activity (Appendix B).

Although logging on private lands has been in accordance with State of Oregon Forest Practice Rules, the quality of riparian bufferstrips, road surfacing and drainage and logging systems (primarily crawler tractor), appear inadequate to protect aquatic and riparian ecosystems. This analysis would consider the extensive recent harvest on private lands.

Table 3- 4. Current watershed condition in the 5 Rogues timber sale area

HUC 6	% BLM	Total Acres	Road Density (mi. per sq. mi.)	**Baseline Conditions.** Minimum % of all acres in the HUC 6 in hydrologic recovered condition in 2002, based on appearance of new openings in the forest canopy between 1974-2002	Transient Snow Zone (TSZ) Acres	% Transient Snow Zone Acres Of All HUC 6 Acres	**Baseline Conditions.** Minimum % of all acres in the TSZ in hydrologic recovered condition in 2002, based on appearance of new openings in the forest canopy between 1974-2002
Grave-Placer	48	12,792	4.9	80	5853	46	82
Grave-Sunny Valley	31	19,572	5.0	73	1225	6	83
Wolf	48	28,343	4.1	80	7297	26	82

(*) Landsat remote sensing technology was used to determine the percentage of each 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; Jones 2000). 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. These open, compacted non-forest acres comprise 6 to 11 % of all acres in each HUC 6 [4 to 6% in TSZ] and are included in baseline conditions. Openings that appeared during 1974-2002 are in various stages of hydrologic recovery. Therefore, estimated percent of acres in proper hydrologic functioning condition in columns 5 and 8 of this table are **minimums**.

Table 3- 5. Year and acreage of vegetation disturbance (fire, timber harvest, etc.) in the Five Rogues Planning Area. Disturbed vegetation is generally in an advanced stage of hydrologic recovery after 20 years and substantially complete by age 30 (Harr 1989; Jones 2000).

Disturbance Period							
Year of comparison satellite photography	Years since disturbance	Wolf Creek HUC6 acres disturbed	% of acres disturbed between 1974 and 2002	Grave Creek-Sunny Valley HUC6 acres disturbed	% of acres disturbed between 1974 and 2002	Grave Creek-Placer Acres HUC6 disturbed	% of acres disturbed between 1974 and 2002
1974-1984	18 to 28	1004	27	477	15	392	26
1984-1989	13 to 18	825	22	1092	35	410	27
1989-1995	7 to 13	1218	33	720	24	348	23
1995-1999	3 to 9	383	10	499	16	306	20
1999-2002	0 to 3	313	8	304	10	68	4
Totals		3742	100	3092	100	1525	100

Road density is moderate to high in the three HUC 6 watersheds, ranging from about 4 to over 5 miles per square mile. The surface condition of about 40% of the road network miles in the Planning Area (virtually all in private commercial forest ownership) is not well-documented but most probably is native surface. Although most BLM roads are rocked, some constructed decades ago do not meet current standards for drainage, safety and other concerns.

Streams and Riparian Habitat

Although several streams in the project area are fish-bearing (Table 3-6), only one proposed harvest unit is adjacent to fish habitat (Unit 33-13, cutthroat trout). Grave Creek, Coyote Creek and Wolf Creek provide habitat for Southern Oregon/Northern California (SO/NC) coho salmon, an ESA-listed threatened species. Most of the fish habitat in the Planning Area area has been degraded by timber harvest and road construction. These same three streams are State of Oregon-designated water quality limited for maximum water temperature during summer. Habitat factors that are probably limiting aquatic productivity and fish production include high summer water temperature and low summer streamflow (a combination of natural and human-caused), lack of large wood, poor pool quality and depth and excessive sediment in substrate (Appendix B).

Table 3- 6. Approximate miles of fish habitat in the vicinity of the Five Rogues Project Area.

Stream Name	Miles of Fish Habitat
Grave Creek	8.5
Mackin Gulch	0.6
Flume Gulch	2.5
Mill Creek (Dog Creek)	1.2
Rat Creek	1.4
Burgess Gulch	0.9

Stream Name	Miles of Fish Habitat
Benjamin Gulch	0.3
Coyote Creek	4.6
Wolf Creek	3.1

Most riparian zones in the watershed on private and federal lands do not support the vegetation that is needed for stream and riparian integrity as described in the Northwest Forest Plan. For instance, only 55% of riparian reserve acreage on BLM (5074 of 9224 acres) is greater than 80 years of age, the age at which late successional characteristics begin to appear. The percentage is probably considerably less on private lands.

Soils

Soils of the units within the Planning Area are composed of residium and colluvium of metasedimentary rock types of the Galice Formation with a few exceptions. These soils were typed by the Natural Resource Conservation Service (NRCS) as belonging to the Speaker, Josephine or Pollard soils series or complexes of the three. They are generally well suited for forest development and management and have over 30 inches of depth and fairly high clay content. The units near the ridgelines were types as being Beekman series which are suited for forest development and have soil depths of up to 20 inches. Three units were typed as belonging to the Cornutt series which is derived from ultramafic rock types including serpententite. This soil is typed as suitable for forest development but due to a higher magnesium content and lower calcium content than that of the metasedimentary soils, the vegetation tends to grow slower. Information for soils was derived from NRCS Josephine County Soil Surveys and have been ground-verified by BLM personnel.

Moderate erosion potential exists for all soils in the project area. Field personnel did not detect any areas within the project area within units that were unstable or had the potential for mass movement, except at the end of a road near units 18-2 and 18-7. Because historic wildfire resulted in much greater acreage in open condition (no or minimal ground cover or canopy closure) than at present (Grave Creek Watershed Analysis, pp.70-76), existing stream channel capacity reflects peak flow conditions under historic wildfire regimes (Harr 1989). However, high road density changes hydrologic response of watersheds and can increase the magnitude of peak flows beyond the range of natural variation.

3.10 Visual Quality

The Five Rogues Planning area contains a variety of natural and human-created landscape types. These include conifer and hardwood forests, past and present forest clear-cuts in various stages of reforestation, flat valley bottoms to steep mountain ridges, rock outcroppings, pastures, natural forest openings, streams and tributaries. Physical structures within the landscape include a freeway and rural roads, commercial and residential buildings, power lines, fences, a historic covered bridge, and tourist facilities. The dominate feature in this landscape is the forest covered mountains.

3.11 Special Forest Products

The Project area has a diverse array of special forest products. The potential for commercial use is relatively high because of the ready access off Interstate 5 and the close proximity to several population centers. Some of the more important special forest products found in the project area include:

The rural community of the Grave Creek dainage has historically used wood as a heat source and likely would continue to do so into the future. In the Planning Area, this is the special forest product most in demand, for both personal and commercial purposes. The species most requested are pacific madrone and oak, although any species in slash and near rocked roads is suitable. Recently, however, fewer timber sales, less slash production, riparian area protection, less road building and closing of roads have combined into less than the traditional supply of firewood.

Other products coming from conifers have been sold such as posts and poles. A large inventory for these types of material, also referred to as "smallwood" is present in the Glendale Resource Area and in the Planning Area in particular.

3.12 Recreation

The Planning Area contains a variety of dispersed as well as formal recreational opportunities from a Museum tour, to hunting and fishing, hiking, swimming, and horse-back riding. Sunny Valley is home the Radio Park Museum, the Applegate Trail Museum and the historic Grave Creek Covered Bridge. Wolf Creek is home to the London Peak Trail, the Wolf Creek Park, and the historic Wolf Creek Inn. Each of these popular Southwestern Oregon visitor attractions are marketed via local and regional media sources as well as having formal signage on Interstate 5. Sunny Valley is also the site of the proposed Salmon Creek Interpretive Forest which would encompass hundreds of acres of recreational trail use. This project is being analyzed in a separate environmental analysis.

Chapter 4 – Environmental Consequences

4.1 Introduction

This chapter forms the scientific and analytic basis for comparison of Alternatives. Discussions include environmental impacts anticipated from implementation of the Alternatives, both positive and negative. It also identifies and analyzes mitigation measures, if any, which may be taken to avoid or reduce projected impacts. Discussions of the environmental consequences are site specific and might not have been fully analyzed in the *Final Medford District Proposed Resource Management Plan/Environmental Impact Statement* (RMP/EIS) and amendments. In keeping with the directives of the National Environmental Policy Act (NEPA), the discussions focus on impacts considered potentially significant. The level of detail and depth of impact/analysis are generally limited to that needed to determine whether new significant environmental effects are anticipated.

Direct, indirect and cumulative effects were considered.

> **Direct effects** are site-specific and result from the immediate action, such as the harvest of a timber sale unit or the construction of a particular road. Direct effects are confined to a specific area such as a timber sale unit, a particular elk range, or a spotted owl site, and can be short term or long term.
>
> **Indirect effects** occur at a different place or time than the proposed action.
>
> **Cumulative effects** are generally not site-specific and are not readily attributable to any one action. Cumulative effects are the result of past, immediate, and reasonably foreseeable actions on a larger area, such as a watershed, regardless of ownership.

4.2 Effects on Fire and Fuels

Direct and Indirect Effect

Alternative 1 (No Action)

Stand densities would remain unchanged. This would continue the trend for shade tolerant species to promote an increase in ladder fuels. As mortality continues in these stands, snag populations and down, woody fuels would continue to accumulate. The potential for a large fire to occur increases as the vegetation increases in density and becomes more continuous and homogeneous. A wildfire would have the potential to cause a considerable amount of scorch and mortality of individual trees.

As the vegetation along roads grows due to the lack of maintenance and hazardous fuel treatments, access for firefighting crews would decrease. A decrease in road access and a simultaneous increase in fuel loading would increase the probability of a large, intense wildfire.

Action Alternatives (alts 2,3,4).

The action Alternatives would reduce the vertical fuel ladders and overstocked conditions and reduce the potential risk of catastrophic fire.

In the short term, logging residue would create higher fuel loadings on the ground compared to the No Action Alternative. Fuel amounts are measured in tons per acre for different size material. Material up to 3 inches in diameter has the greatest influence on the rate of spread and flame length of a fire and, therefore, fire suppression efforts. Prior to fuels treatments, fuel loadings after thinning would be increased by approximately 10-15 tons per acre. These conditions would allow a higher rate of spread and greater flame lengths. Prior to fuels treatments on regeneration harvest units, fuel loadings would increase 20-35 tons per acre. These units would exhibit higher rates of spread and flame lengths than the thinning units.

Conversely, removal of smaller trees would reduce ladder fuels in harvested stands. The potential for a large fire occurring is reduced as stand density is reduced. Reducing canopy cover to 40 to 60 percent would reduce (but not completely eliminate) the potential for running crown fires. The ladder fuel induced crown fire potential would also be reduced. In stands identified for regeneration harvest, the reduction of heavy ground fuels through site preparation treatments would reduce fire hazard. Timber harvest would break up the vegetation and create a mosaic of age and size classes across the landscape. A mosaic of stand types would prevent fires from burning entire drainages since this condition would slow the spread of fire and allow direct attack by hand crews.

Prescribed burning would be conducted during a time of year when the likelihood of fire escaping into the tree canopy is lowest, but could occur any time of year under appropriate weather conditions.

Cumulative effects

Untreated areas in all Alternatives would perpetuate current conditions and in many mature stands growth and deterioration would increase fuel loading. These conditions over time would increase the potential for a stand replacement fire within and/or adjacent to the Five Rogues Analysis Area. All action Alternatives propose treatments to reduce fire hazard and decrease long-term adverse cumulative effects. This opportunity to reduce fire hazard would not occur under the No Action Alternative.

4.3 Effects on Air Quality

Alternative 1 (No Action)

Under Alternative 1, no prescribed fuels treatments proposed under this EA would occur. Wildfires generally occur at times and under conditions that impact local air quality to a greater extent than under prescribed fire conditions.

Action Alternatives (alts 2,3,4)

Short-term increase of particulates in the air, primarily from smoke, would be anticipated under all the action Alternatives. Road construction/maintenance, vehicle emissions and dust along with silvicultural practices also contribute slightly to the temporary degradation of air quality in the Planning Area. Prescribed burning and dust from roads and machinery would temporarily affect local air quality, but would not constitute an irretrievable or irreversible commitment of resources.

The use of prescribed fire to reduce flammability and excess levels of fuels would affect long-term forest productivity by reducing the risks and consequences of a major wildfire. The temporary impacts of smoke from prescribed fire would have minor effects on the use of forest resources, such as recreation sites and scenic resources. Long-term benefits of using prescribed fire to reduce natural fuels would more than outweigh the short-term impacts to air quality.

Direct and Indirect Effects

All action Alternatives would affect air quality by the addition of certain pollutants (Particulate Matter (PM_{10}) and Particulate Matter ($PM_{2.5}$)). In comparison, the difference among Alternatives is very small. At these levels and following prescribed fire management guidelines in the Oregon Smoke Management Plan there would be negligible direct or indirect effects on air quality under all action Alternatives.

Under all proposed action Alternatives, prescribed burning would comply with the guidelines established by the Oregon Smoke Management Plan (OSMP) and the Visibility Protection Plan. Prescribed burning under all Alternatives is not expected to effect visibility within the Crater Lake National Park and neighboring wilderness smoke sensitive Class I areas (Kalmiopsis and Rogue Wilderness) during the visibility protection period (July 1 to September 15). Prescribed burning is not routinely conducted during this period primarily due to the risk of an escape wildfire.

Prescribed burning emissions, under all Alternatives, is not expected to adversely effect annual PM10 attainment within the Grants Pass and Medford/Ashland non-attainment areas. The project area is approximately 15 miles from the Grants Pass non-attainment area and over 35 miles from the Medford/Ashland non-attainment area. These non-attainment areas are far enough away that they should not be affected by prescribed fire activities within the Planning Area. The non-attainment status of these communities is not attributable primarily to prescribed burning. Major sources of particulate matter within the Rogue Valley are smoke from woodstoves, dust, and industrial sources. The contribution to the non-attainment status of particulate matter from prescribed fire has historically been less than 4 percent of the annual total. Any smoke intrusions into these areas from prescribed burning are anticipated to be light and of short duration.

Prescribed burning would be scheduled primarily from January and ending through June. This would minimize smoke emissions from burning when duff and dead woody fuel have the highest moisture content and would reduce the amount of material actually burned. Handpile burning, and underburning would also be planned during the winter and spring months to reduce damage to the site from high intensity burning and to facilitate control of the units being burned.

The greatest potential for smoke intrusions into the non-attainment areas would come from underburning activities. Current avoidance strategies for prescribed fire assumes that smoke can be lifted from the project site and dispersed and diluted by transport winds. However, underburning requires a low intensity burn that would not have the energy to lift the smoke away from the project site. Smoke retained on site could be transported into portions of non-attainment areas if it is not dispersed and diluted by anticipated weather conditions. Localized concentration of smoke in rural areas away from non-attainment areas may continue to occur during prescribed burning operations.

Cumulative Effects

Direct and indirect impacts on visibility would be additive to existing conditions where visibility and air quality appear to be excellent. Thus, there would be a negligible effect on air quality including visibility under the Alternatives. Burning would be done in accordance with smoke management clearance where cumulative effects of smoke would be minimized.

4.4 Effects on Cultural Resources

Proposed management activities with the potential to effect cultural resources include timber harvest, fuels treatments, and road construction.

Alternative 1 (No Action)

Under Alternative 1, the current level of cultural resource site protection from potential disturbance caused by management activities would be maintained. However, it should be noted that under this Alternative large amounts of naturally occurring fuel are able to build up and this in turn can indirectly place archaeological resources at some risk due to the potential of a large wildland fire outbreak.

Action Alternative (alts 2,3,4)

Under Alternative 2 new road construction would have a moderate risk for impacts to archaeological sites. Ground disturbance resulting from timber harvest activities would increase under Alternatives 2, 3, and 4. Of these Alternatives, 2 and 3 have a somewhat higher potential for archaeological site disturbance or destruction resulting from higher impact harvest techniques coupled with an increased amount of acres scheduled for harvest. Management recommendations for site protection using PDF's would be followed.

The possibility of looting and unauthorized relic collecting at archaeological sites would increase under Alternatives 2, 3 and 4 through increased access and visibility of archaeological sites. Looting could impact not only the archaeological site itself, but could render the scientific data sometimes collected from these sites impossible to interpret. This could happen equally under each of the action Alternatives.

Fuels reduction projects included under Alternatives 2, 3 and 4 could impact archaeological sites. Fuels projects would have a low to moderate impact on cultural resource sites because of the potential disturbance to the surface of the ground where sites are located and due to the fact that

some of the newly recorded archaeological sites found on this survey are historic wooden structures which require protection from fire. Because these structures have the ability to be destroyed management guidelines which protect archaeological sites in fuels areas would be followed.

However, the continued growth of vegetation and the associated fuels accumulation if not removed can also be considered a threat to cultural resources. The possibility of a large catastrophic burn could occur. By not treating these fuels, historic archaeological sites could be harmed or destroyed.

Impacts would be caused by ground disturbing activity which can damage or destroy archaeological sites or their context. Many times road construction can take place in areas considered high probability for locating and finding archaeological sites. However, the threat to cultural resources in the new road construction under alternative 2 is considered low due to the fact that the proposed road location is mid slope. The mid slope road location is considered low probability for the finding of archaeological resources. All proposed new road construction routes would be surveyed prior to project implementation.

Under Alternative 4 ground disturbance activities resulting from timber harvest activities would still have the potential to impact sites however, the risk would be somewhat smaller than in Alternatives 2 and 3 due to the fact that less acres would be impacted and thus decreases the potential for impacts to archaeological sites. Under Alternative 2 and 3 no new road construction is proposed so there would be no risk to cultural resources resulting from road construction. Fuels reduction projects would still take place under this Alternative but would pose the same risks as stated under Alternatives 2 and 3.

Table 4- 1. Potential for Adverse Effects to Cultural Resources

Proposed Project	Alternative 1 - No Action	Alternative 2	Alternative 3	Alternative 4
Timber harvest	N	M	H to M	M
Fuels reduction	L	L	L	L
New road construction	N	N	M to L	N

L= low
M=medium
H= high
N= no impact

4.5 Effects on Invasive Species

Alternative 1 (No Action Alternative)
Noxious weeds would continue to invade the Planning Area. The I-5 corridor and existing roads in the Planning Area provide movement of reproductive parts, such as seeds, carried by vehicles.

Action Alternatives (alts. 2,3,4)

Ground disturbance and burning, associated with the cutting and removal of logs, creation of landing areas, broadcast or pile burning and the creation of openings, as well as, the opening of or improvements to roads may allow noxious and invasive species to spread or to become established in the Project Area under the Action Alternatives.

4.6 Effects on Threatened, Endangered, & Special Status Wildlife and Habitat

Late Successional Habitat

At the Grave Creek fifth-field watershed level, none of the Alternatives would have substantial direct effects on late-successional habitat. Impacts to late-successional habitat and associated late-successional species were assessed in the Medford District Resource Management Plan (USDI 1995) and the Northwest Forest Plan (USDA/USDI 1994), and the level of impact associated with all of the action Alternatives is within the range described in those documents. Issues related to the ability for late-successional affiliated species to move and have genetic exchange, or connectivity, were also addressed in the NFP (pp 3 &4-38-3&4-44). In the Oregon Klamath Province,which contains the Five Rogues Planning Area, the likelihood of either very strong or strong connectivity was 66 percent. The outcome was strengthened in the NFP by the addition of Riparian Reserve Scenario 1 which increased reserves associated with intermittent streams (USDA and USDI 1994, p. 3&4-242). This outcome for connectivity was an analysis of future conditions that would result over time as late-successional and riparian reserves across the landscape advanced in age. Strong connectivity was defined as less than 12 miles between large late-successional areas and a landscape of over 50 percent late successional forest (FEMAT 1993, IV-52). The NFP acknowledged that the present condition of most of the NFP planning areas did not meet the definition of very strong or strong connectivity in the short term.

Direct Effects

Alternative 1, the No Action Alternative, is expected to have little impact on late-successional habitat and old-growth forest associated species. It is anticipated that the 346 acres of stands proposed for regeneration harvest and overstory removal would continue to develop as older forest, with the effect of contributing additional standing and large downed wood.

The lack of fuels treatments would increase the risk of stand replacement fire in older stands with existing dense timber and brush, with stands becoming denser over time. Catastrophic loss of vegetation would threaten late-successionally affiliated species which depend on these forest habitats for short-term survival, reproduction, and dispersal.

Alternative 2

Alternative 2 is expected to have some short-term impacts to late-successional habitat and mature and old-growth forest-associated species. As noted in ecosystem analysis documents (USDI 1999, p. 51) prior harvest on both public and private land has resulted in a highly fragmented landscape with isolated pieces of late-successional habitat comprising only approximately 39% of the federal lands in the watershed. Under Alternative 2, the consequences

of this Alternative would increase this situation through proposed regeneration harvest of 346 acres in 21 harvest units, or approximately 2%, of the remaining late-successional habitat in this area. The proposed 821 acres of commercial thinning in 30 units are designed to leave approximately 40 -60% canopy closure post-harvest, and are expected to reduce the functionality of late-successional habitat for associated wildlife species through removal of green trees, and a reduction in potential future recruitment of snags and large downed wood.

The importance of connectivity in the analysis area is highlighted by the biological assessment and biological opinion of the Fish and Wildlife Service that this area provides the single link from the Western Cascades Province to the Klamath Mountains Province and the I-5 Area of Concern (BA, Appendix B-1,2 USDA/USDI 2003), providing critical landscape linkages. The Grave Creek watershed analysis (USDI 1999, p. 52) notes that the central portion of the watershed, where this action is proposed, currently consists of conditions which create a barrier to east-west movement, including the I-5 corridor, the towns of Sunny Valley and Wolf Creek, and past timber harvest practices. Alternative 2 is expected to further reduce the ability of these linkages to function as a result of the proposed 346 acres of regeneration harvest. The proposed 17 acres of group selection treatments in units #13-3 and #18-1 and 17 acres of regeneration harvest in unit #17-2, along with 44 acres of regeneration harvest in unit #29-1, are expected to impact late-successional habitat with additional interior forest habitat removal in two of only six large late-successional blocks in the watershed.

The three connectivity blocks in the analysis area would be degraded as a result of proposed timber harvest treatments, but would maintain above the minimum level of 25-30% late-successional habitat specified in the RMP (USDI 1995, p.48). The extreme northern block, located in S1, T33S, R6W, would be affected by the selective thinning of 59 acres and regeneration harvest treatments on 13 acres, with an estimated 1% reduction in the current amount of late-successional habitat, from 59% to 58% post-harvest. The connectivity block located in S17,T33S, R5W, is expected to be degraded by 30 acres of regeneration harvest, resulting in this block having 85% of its habitat in a late-successional condition post-treatment, still well above the 25-30% level called for in the RMP. However, this block is one of only six large interior forest blocks in the watershed. Since the regeneration harvest units are adjacent to an older stand to the west which contains a northern spotted owl core, with additional older forest to the east, the area where the regeneration harvest is planned is located in interior habitat, and is expected to result in additional fragmentation. The connectivity block in the southernmost portion of the analysis area, located in S15, T34S,R6W, would also be degraded by the proposed 49 acres of regeneration harvest and 31 acres of commercial thinning treatments, resulting in 77% post-harvest late-successional habitat.

Fire is thought to be the most important agent of disturbance in the Klamath Province (USDA/USDI 1995). The 281 acres proposed pile burning and underburning fuels treatments would reduce the vertical fuel ladders and overstocked conditions which can increase the risk of loss of late-successional habitat. The slash/pile/burning treatments would target small-diameter material, and it is therefore expected that late-successional habitat would be largely unaffected, although there could be some incidental removal of large wood in these operations. The underburning proposals would reduce ground and small-diameter ladder fuels, but because these burns would occur in spring when there is high moisture content, material larger than 3-6” is not anticipated to be lost, and therefore loss of large downed wood from these activities is not expected. Likewise, the removal of 16 acres of small-diamater material as a result of the

proposed small wood product extraction is expected to reduce the risk of stand-replacement wildfire, and is not expected to affect late-successional habitat, since no material larger than 8“ is expected to be removed. There is a small risk from pile burning and underburning of escapement and subsequent threat to late-successional habitat.

Fuels treatments associated with site preparation (broadcast burning) for regeneration harvest activities on 346 acres can be expected to reduce amounts of large downed wood.

The 2.35 miles of new road construction in this Alternative include approximately .66 mile of new road construction outside of units. Impacts above the amount estimated from timber harvest involve approximately 2 acres of late-successional habitat removal from permanent new roads. The proposed 1.4 mile ridge road in S13 and S18, T33S, R5W, #33-5-18.1, is expected to fragment an unentered portion of this old-growth block, with subsequent disturbance effects to late-successionally affiliated wildlife. The northern section of approximately 0.5 mile of proposed new road construction in S18, T33S,R5W, #33-5-18.2, is similarly expected to fragment currently undisturbed habitat in an old-growth block, with subsequent disturbance to late-successionally affiliated wildlife. These roads would also provide access for future timber harvest. The proposed 0.55 miles of temporary road construction are expected to cause additional impacts to approximately 1.5 acres of late-successional habitat, since it would take approximately 60-80 years to begin to approach mature forested habitat within the road prism.

The approximately 0.85 miles of proposed road decommissioning would result in a reduction of disturbance impacts to late-successionally affiliated wildlife species, add to the development of late-successional forest, and subsequently reduce the risk of predation.

Northern Spotted Owls

It is expected that the Federal Land allocations, standards, and guides are those necessary to achieve recovery of the northern spotted owl (USDA/USDI 1994, p.2-73). The primary reason for listing the northern spotted owl as a threatened species involved concerns over the impact of habitat loss and modification resulting from timber harvest (USDA/USDI 1994). All of the action Alternatives are expected to adversely affect northern spotted owls, a federally listed (Threatened) species. However, the amount of anticipated adverse impacts to spotted owls in the analysis area has been accounted for through consultation and incidental take with the Fish and Wildlife Service (USDA/USDI 2003). In recent years the Fish and Wildlife Service has reevaluated the method for analyzing incidental take of northern spotted owls, with a shift from a former analysis based on acres of suitable habitat removed or degraded within an individual owl pair’s home range to the current method of accounting for incidental take by the removal or degradation of all suitable habitat acres. Suitable habitat is considered to be forest with older structure, multiple canopies, canopy closure of 60 percent or greater, and having conifers at least 24” in diameter (p. 40, USDA/USDI 2003). The proposed action would result in a “take” of suitable northern spotted owl habitat, based upon the habitat removal of 346 acres in regeneration harvest and overstory removal units, and habitat degradation of 821 acres in commercial thinning units.

Proposed road construction impacts to northern spotted owls include the 2.35 miles of new permanent road construction, with approximately .66 mile of these miles outside of treatment units. Impacts above the amount estimated from timber harvest involve approximately 2 acres of

late-successional habitat removal. The proposed 1.4 mile ridge road in Section 13 and Section 18, T33S, R5W, #33-5-18.1, is expected to fragment an unentered portion of this old-growth block, and its beginning lies immediately adjacent to two northern spotted owl activity centers. The northern section of approximately 0.5 mile of proposed new road construction in S18, T33S,R5W, #33-5-18.2, is similarly expected to fragment currently undisturbed habitat in an old-growth block, and it begins immediately adjacent to a northern spotted owl activity center. These roads would also provide access for future timber harvest. The proposed 0.55 miles of temporary road construction are expected to cause additional impacts to approximately 1.5 acres of late-successional habitat, since it would take approximately 60-80 years to begin to approach mature forested habitat within the road prism.

Northern Spotted Owl Critical Habitat

There is one Northern Spotted Owl Critical Habitat Unit (#OR-32) in the planning area, in the eastern sector, which would be affected by the action Alternatives. The actions which are proposed may affect northern spotted owl critical habitat through habitat removal and/or habitat degradation, which can appreciably slow the development of the primary elements of suitable spotted owl habitat. However, these impacts were addressed by consultation with the Fish and Wildlife Service (USDA/USDI 2003).

Under Alternative two, there would be direct impacts to OR-32 through the removal of 125 acres of currently suitable habitat, and the downgrading to dispersal habitat of an additional 111 acres through commercial thinning treatments. This impact is considered moderate, given the connectivity emphasis which has been placed on this area (USDA/USDI 2001).

Proposed road construction impacts to northern spotted owl critical habitat includes 2.35 miles of new road construction in CHU #OR-32, with approximately .66 mile of new road construction outside of units. Impacts above the amount estimated from timber harvest involve approximately 2 acres of late-successional habitat removal. The proposed 1.4 mile ridge road in S13 and S18, T33S, R5W, #33-5-18.1, is expected to fragment an unentered portion of this old-growth block, and its beginning lies immediately adjacent to two northern spotted owl activity centers. The northern section of approximately 0.5 mile of proposed new road construction in S18, T33S,R5W, #33-5-18.2, is similarly expected to fragment currently undisturbed habitat in an old-growth block, and it begins immediately adjacent to a northern spotted owl activity center.

Fisher (Candidate and Bureau Sensitive)

Fishers have been found four miles south of the Resource Area boundary, and nine miles southwest of the analysis area boundary. Fishers have a very large home range in the Klamath Province, with male fishers described as having home ranges up to 128 km^2, or about 32,000 acres (USDI 2004, p.18772) and thus are expected to occur here, although limited surveys have thus far failed to document them in the analysis area. It is thought that fishers may select forests that have low and closed canopies, and in the Klamath region fishers have been found to have a strong association with high levels of tree canopy cover, percent conifer, and larger tree size class (USDI 2004, p.18773,). Studies have also shown fishers to be associated with riparian areas (USDI 2004, p.18773), and treatments in this proposal would not occur in riparian zones. The proposed action would remove 416 acres of currently suitable, closed canopy forest. Proposed new road construction would involve approximately 2.4 miles of road in undisturbed

old-growth habitat. 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 (Appendix J-2, USDA/USDI 1994). This project would not change the trend predicted in the NFP.

Townsend's Big-Eared Bat (Bureau Sensitive)

Since the known Townsend's big-eared bat adits would be protected from timber harvest with a 250' buffer, and also with a 100' buffer for fuels treatments, it is expected the microclimate would be largely unaffected by proposed activities. It is also expected fuels treatments would reduce the chance of stand-replacement wildfire, thus benefiting the microclimate adjacent to the adits.

Northern Goshawk (Bureau Sensitive)

Impacts to raptors, including goshawks, were analyzed in the RMP (USDI 1995), and effects from this project are within the scope of that analysis. Although limited surveys in the analysis area have thus far not documented this species, it has been found to be nesting in the western portion of the watershed, and is therefore expected to occur in suitable habitat in the analysis area. Goshawks prefer to nest in the largest oldest conifer stands. Under this Alternative, 416 acres of currently suitable closed canopy forest would be removed, and can be expected to no longer provide goshawk habitat. Proposed new road construction would involve approximately 2.4 miles of road in undisturbed old-growth habitat.

Western Pond Turtle (Bureau Sensitive)

Since western pond turtles inhabit ponds and slow-moving water in the forested matrix, with proposed treatments occurring outside riparian reserves it is anticipated there would be little effect on pond turtles in this Alternative.

Cumulative Effects on Late-Successional Habitat

Past timber harvest on both federal and private lands in the central portion of the Grave Creek watershed, where the project area occurs, has left a highly fragmented landscape which has substantively reduced both the quality and quantity of late-successional habitat. The current proposal includes additional timber harvest in the area of past harvest, resulting in direct cumulative effects of a moderate level of impact.

Road construction for permanent roads directly impacts late-successional habitat, and would result in a relatively small, but irretrievable commitment of resources. The 2.35 miles of new road construction in this Alternative include approximately .66 mile of new road construction outside of units. Impacts above the amount estimated from timber harvest involve approximately 2 acres of late-successional habitat removal. The proposed 1.4 mile ridge road in S13 and S18, T33S, R5W, #33-5-18.1, is expected to fragment an unentered portion of this old-growth block, with subsequent disturbance effects to late-successionally affiliated wildlife. The northern section of approximately 0.5 mile of proposed new road construction in S18, T33S,R5W, #33-5-18.2, is similarly expected to fragment currently undisturbed habitat in an old-growth block, with subsequent disturbance to late-successionally affiliated wildlife.

Alternative 3

Under Alternative 3, there are expected to be some short-term impacts to late-successional habitat and mature and old-growth forest associated species. As noted in ecosystem analysis documents (p. 51,USDI 1999) prior harvest on both public and private land has resulted in a highly fragmented landscape with isolated pieces of late-successional habitat comprising only approximately 39% of the federal lands in the watershed. Under Alternative 3, the consequences of this action would increase this situation through proposed regeneration harvest of 346 acres in 21 harvest units, or approximately 2%, of the remaining late-successional habitat in this area. In addition, the proposed 776 acres in 29 commercial thinning units designed to leave approximately 40 -60% canopy closure post-harvest are expected to reduce the functionality of late-successional habitat for associated wildlife species.

The importance of connectivity in the analysis area is highlighted by the biological opinion of the Fish and Wildlife Service that this area provides the single link from the Western Cascades Province to the Klamath Mountains Province and the I-5 Area of Concern (p.1&2,Appendix B-1, USDA/USDI 2003), providing critical landscape linkages. The Grave Creek watershed analysis (p. 52, USDI 1999) notes that the central portion of the watershed, where this action is proposed, currently consists of conditions which create a barrier to east-west movement, including the I-5 corridor, the towns of Sunny Valley and Wolf Creek, and past timber harvest practices. The proposed action under Alternative 3 is expected to further reduce the ability of these linkages to function as a result of the proposed 346 acres of regeneration harvest. The proposed 17 acres of group selection treatments in units #13-3 and #18-1. and 17 acres of regeneration harvest in unit #17-2, along with 44 acres of regeneration harvest in unit #29-1, are expected to impact late-successional habitat with additional interior forest habitat removal in two of only six large late-successional blocks in the watershed.

The three connectivity blocks in the analysis area would be degraded as a result of proposed timber harvest treatments, but would maintain the minimum level of 25-30% late-successional habitat specified in the RMP (p.48, USDI 1995). The extreme northern block, located in S1, T33S, R6W, would be affected by the selective thinning of 59 acres and regeneration harvest treatments on 13 acres, with an estimated 1% reduction in the current amount of late-successional habitat. The connectivity block located in S17,T33S, R5W, is expected to be degraded by 30 acres of regeneration harvest, resulting in this block having 77% of its habitat in a late-successional condition post-treatment, still well above the 25-30% level called for in the RMP. However, this block is one of only six large interior forest blocks in the watershed. Since the regeneration harvest units are adjacent to an older stand to the west which contains a northern spotted owl core, with additional older forest to the east, the area where the regeneration harvest is planned is located in interior habitat, and results in additional fragmentation. The connectivity block in the southernmost portion of the analysis area, located in S15, T34S,R6W, would also be degraded by the proposed 49 acres of regeneration harvest and 31 acres of commercial thinning treatments.

Fire is thought to be the most important agent of disturbance in the Klamath Province (USDA/USDI 1995). The 281 acres of proposed underburn and slash/pile/burn fuels treatments would reduce the vertical fuel ladders and overstocked conditions which can increase the risk of loss of late-successional habitat. The underburning proposals would reduce ground and small-diameter ladder fuels, but because these burns would occur in spring when there is high moisture

content, material larger than 3-6" is not anticipated to be lost, and therefore loss of large downed wood from these activities is not expected. The slash/pile/burning treatments would target small-diameter material, and it is therefore expected that late-successional habitat would be largely unaffected, although there could be some incidental removal of large wood in these operations. Likewise, the removal of 16 acres of small-diamater material as a result of the proposed small wood product extraction is expected to reduce the risk of stand-replacement wildlife, and is not expected to affect late-successional habitat, since no material larger than 8" is expected to be removed. There is a small risk from underburning and slash/pile/burning of escapement and subsequent threat to late-successional habitat.

Fuels treatments associated with site preparation (broadcast burning) for regeneration harvest activities on 346 acres can be expected to reduce amounts of large downed wood.

This Alternative has no new permanent road construction, and thus there would be no disturbance impacts to wildlife from new road construction. The proposed 0.55 miles of temporary road construction are expected to cause additional impacts to approximately 1.5 acres of late-successional habitat, since it would take approximately 60-80 years to begin to approach mature forested habitat within the road prism

The approximately 0.85 miles of proposed road decommissioning would result in a reduction of disturbance impacts to late-successionally affiliated wildlife species, add to the development of late-successional forest, and subsequently reduce the risk of predation.

Northern Spotted Owls

It is expected that the Federal Land allocations, standards, and guides are those necessary to achieve recovery of the northern spotted owl (USDA/USDI 1994, p.2-73). The primary reason for listing the northern spotted owl as a threatened species involved concerns over the impact of habitat loss and modification resulting from timber harvest (USDA/USDI 1994). All of the action Alternatives are expected to adversely affect northern spotted owls, a federally listed (Threatened) species. However, the amount of anticipated adverse impacts to spotted owls in the analysis area has been addressed through consultation and provision of incidental take with the Fish and Wildlife Service (USDA/USDI 2003). In recent years the Fish and Wildlife Service has reevaluated the method for analyzing incidental take of northern spotted owls, with a shift from a former analysis based on acres of suitable habitat removed or degraded within an individual owl pair's home range to the current method of accounting for incidental take by the removal or degradation of all suitable habitat acres. Suitable habitat is considered to be forest with older structure, multiple canopies, canopy closure of 60 percent or greater, and having conifers at least 24" in diameter (USDA/USDI 2003, p. 40,). The proposed action would result in a "take" of suitable northern spotted owl habitat, based upon the habitat removal of 346 acres in regeneration harvest and overstory removal units, and habitat degradation of 821 acres in commercial thinning units.

The proposed 0.55 miles of temporary road construction are expected to cause additional impacts to approximately 1.5 acres of late-successional habitat, since it would take approximately 60-80 years to begin to approach mature forested habitat within the road prism

The approximately 0.85 miles of proposed road decommissioning would result in a reduction of disturbance impacts to late-successionally affiliated wildlife species, add to the development of late-successional forest, and subsequently reduce the risk of predation.

Northern Spotted Owl Critical Habitat

There is one Northern Spotted Owl Critical Habitat Unit (#OR-32) in the planning area, in the eastern sector, which would be affected by the action Alternatives. The actions which are proposed may affect northern spotted owl critical habitat through habitat removal and/or habitat degradation, which can appreciably slow the development of the primary elements of suitable spotted owl habitat. However, these impacts were addressed by consultation with the Fish and Wildlife Service (USDA/USDI 2003).

Under Alternative 3, there would be direct impacts to OR-32 through the removal of 125 acres of currently suitable habitat, and the downgrading to dispersal habitat of an additional 111 acres with commercial thinning treatments. This impact is considered moderate, given the connectivity emphasis which has been placed on this area (USDA/USDI 2001).

Fisher (Candidate and Bureau Sensitive)

Fishers have been found approximately four miles south of the Resource Area boundary, and approximately ten miles southwest of the analysis area boundary. Under Alternative 3, the action would remove 346 acres of currently suitable, closed canopy forest, a reduction of approximately 2% of the remaining late-successional habitat in the watershed. The project would retain all downed wood cover, all riparian habitat, and 6-8 trees per acre. Some potential den sites may be lost. The consequences of these impacts on individual fishers in the Planning Area, or the population as a whole, are not known. Some reduction in movement corridors for fisher in or adjacent to the project is likely. The extent of this reduction on the overall habitat conditions of fishers is unknown. 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 (Appendix J-2, USDA/USDI 1994). This project would not change the trend predicted in the NFP.

Townsend's Big-Eared Bat (Bureau Sensitive)

Since the known Townsend's big-eared bat adits would be protected from timber harvest with a 250' buffer, and also with a 100' buffer for fuels treatments, it is expected the microclimate would be largely unaffected by proposed activities. It is also expected fuels treatments would reduce the chance of stand-replacement wildfire, thus benefiting the microclimate adjacent to the adits.

Northern Goshawk (Bureau Sensitive)

Impacts to raptors, including goshawks, were analyzed in the RMP (USDI 1995), and effects from this project are within the scope of that analysis. Although limited surveys in the analysis area have thus far not documented this species, it has been found to be nesting in the western portion of the watershed, and is therefore expected to occur in suitable habitat in the analysis area. Goshawks prefer to nest in the largest oldest conifer stands. Under this Alternative, 346

acres of currently suitable closed canopy forest would be removed, and can be expected to no longer provide goshawk habitat.

Western Pond Turtle (Bureau Sensitive)

Since western pond turtles inhabit ponds and slow-moving water in the forested matrix, with proposed treatments occurring outside riparian reserves it is anticipated there would be little effect on pond turtles in this Alternative.

Cumulative Effects on Late-Successional Habitat

Past timber harvest on both federal and private lands in the central portion of the Grave Creek watershed, where the project area occurs, has left a highly fragmented landscape which has substantively reduced both the quality and quantity of late-successional habitat. The current proposal includes additional timber harvest in the area of past harvest, resulting in direct cumulative effects of a moderate level of impact. Under Alternative Three, there would be no irretrievable commitment of resources as a result of permanent road construction.

Alternative 4

Under Alternative 4, there are expected to be some short-term impacts to late-successional habitat and mature and old-growth forest associated species. As noted in ecosystem analysis documents (USDI 1999, p. 51) prior harvest on both public and private land has resulted in a highly fragmented landscape with isolated pieces of late-successional habitat comprising only approximately 39% of the federal lands in the watershed. Under Alternative 4, the consequences of the proposed action would increase this situation through proposed regeneration harvest of 226 acres in 15 harvest units, or approximately 1%, of the remaining late-successional habitat in this area. In addition, the proposed 674 acres in 22 commercial thinning units designed to leave approximately 40 -60% canopy closure post-harvest are expected to reduce the functionality of late-successional habitat for associated wildlife species. An additional eight units comprising 147 acres would maintain 60% canopy closure, but are expected to have some reduction in green trees and future snag and downed wood recruitment.

The importance of connectivity in the analysis area is highlighted by the biological opinion of the Fish and Wildlife Service that this area provides the single link from the Western Cascades Province to the Klamath Mountains Province and the I-5 Area of Concern (p.1&2,Appendix B-1, USDA/USDI 2003), providing critical landscape linkages. The Grave Creek watershed analysis (USDI 1999, p. 52) notes that the central portion of the watershed, where this action is proposed, currently consists of conditions which create a barrier to east-west movement, including the I-5 corridor, the towns of Sunny Valley and Wolf Creek, and past timber harvest practices. The proposed action under Alternative 4 is expected to further reduce the ability of these linkages to function as a result of the proposed 226 acres of regeneration harvest. The proposed 17 acres of group selection treatments in units #13-3 and #18-1, and 17 acres of selective harvest in unit #17-2, along with 44 acres of selective harvest in unit #29-1, are expected to impact late-successional habitat with additional interior forest habitat removal and habitat degradation in two of only six large late-successional blocks in the watershed.

The three connectivity blocks in the analysis area would be degraded as a result of proposed timber harvest treatments, but would maintain the minimum level of 25-30% late-successional habitat specified in the RMP (USDI 1995, p. 52). The extreme northern block, located in S1, T33S, R6W, would be affected by selective harvest on 59 acres and regeneration harvest treatments on 13 acres, with an estimated 1% reduction in the current amount of late-successional habitat. The connectivity block located in S17,T33S, R5W, is expected to be degraded by 30 acres of regeneration harvest, resulting in this block having 77% of its habitat in a late-successional condition post-treatment, still well above the 25-30% level called for in the RMP. However, this block is one of only six large interior forest blocks in the watershed. Since the regeneration harvest units are adjacent to an older stand to the west which contains a northern spotted owl core, with additional older forest to the east, the area where the regeneration harvest is planned is located in interior habitat, and results in additional fragmentation. The connectivity block in the southernmost portion of the analysis area, located in S15, T34S,R6W, would also be degraded by the proposed 49 acres of regeneration harvest and 31 acres of commercial thinning treatments.

Fire is thought to be the most important agent of disturbance in the Klamath Province (USDA/USDI 1995). The 313 acres of proposed underburn and slash/pile/burn fuels treatments would reduce the vertical fuel ladders and overstocked conditions which can increase the risk of loss of late-successional habitat. The underburning proposals would reduce ground and small-diameter ladder fuels, but because these burns would occur in spring when there is high moisture content, material larger than 3-6" is not anticipated to be lost, and therefore loss of large downed wood from these activities is not expected. The slash/pile/burning treatments would target small-diameter material, and it is therefore expected that late-successional habitat would be largely unaffected, although there could be some incidental removal of large wood in these operations. Likewise, the removal of 16 acres of small-diamater material as a result of the proposed small wood product extraction is expected to reduce the risk of stand-replacement wildlife, and is not expected to affect late-successional habitat, since no material larger than 8" is expected to be removed. There is a small risk from underburning and slash/pile/burning of escapement and subsequent threat to late-successional habitat.

Fuels treatments associated with site preparation (broadcast burning) for regeneration harvest activities on 226 acres can be expected to reduce amounts of large downed wood.

This Alternative has no new permanent road construction, and thus there would be no disturbance impacts to wildlife from new road construction. The proposed 0.55 miles of temporary road construction are expected to cause additional impacts to approximately 1.5 acres of late-successional habitat, since it would take approximately 60-80 years to begin to approach mature forested habitat within the road prism.

The approximately 0.85 miles of proposed road decommissioning would result in a reduction of disturbance impacts to late-successionally affiliated wildlife species, add to the development of late-successional forest, and subsequently reduce the risk of predation.

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Northern Spotted Owls

It is expected that the Federal Land allocations, standards, and guides are those necessary to achieve recovery of the northern spotted owl (USDA/USDI 1994, p.2-73). The primary reason

for listing the northern spotted owl as a threatened species involved concerns over the impact of habitat loss and modification resulting from timber harvest (USDA/USDI 1994). All of the action Alternatives are expected to adversely affect northern spotted owls, a federally listed (Threatened) species. However, the amount of anticipated adverse impacts to spotted owls in the analysis area has been addressed through consultation and provision of incidental take with the Fish and Wildlife Service (USDA/USDI 2003). In recent years the Fish and Wildlife Service has reevaluated the method for analyzing incidental take of northern spotted owls, with a shift from a former analysis based on acres of suitable habitat removed or degraded within an individual owl pair's home range to the current method of accounting for incidental take by the removal or degradation of all suitable habitat acres. Suitable habitat is considered to be forest with older structure, multiple canopies, canopy closure of 60 percent or greater, and having conifers at least 24" in diameter (USDA/USDI 2003, p. 40). The proposed action would result in a "take" of suitable northern spotted owl habitat, based upon the habitat removal of 226 acres in regeneration harvest and overstory removal units, and habitat degradation of 674 acres in 22 commercial thinning units, with additional degradation of 147 acres in eight units which would leave 60% canopy closure, but reduce the number of green trees, with impacts to future recruitment of snags and downed wood.

The proposed 0.55 miles of temporary road construction are expected to cause additional impacts to approximately 1.5 acres of late-successional habitat, since it would take approximately 60-80 years to begin to approach mature forested habitat within the road prism

The approximately 0.85 miles of proposed road decommissioning would result in a reduction of disturbance impacts to late-successionally affiliated wildlife species, add to the development of late-successional forest, and subsequently reduce the risk of predation

Northern Spotted Owl Critical Habitat

There is one Northern Spotted Owl Critical Habitat Unit (#OR-32) in the Planning Area, in the eastern sector, which would be affected by the action Alternatives. The actions which are proposed may affect northern spotted owl critical habitat through habitat removal and/or habitat degradation, which can appreciably slow the development of the primary elements of suitable spotted owl habitat. However, these impacts were addressed by consultation with the Fish and Wildlife Service (USDA/USDI 2003).

Under Alternative 4, there would be direct impacts to OR-32 through the removal of 95 acres of currently suitable habitat, and the downgrading to dispersal habitat of an additional 141 acres through selection harvest and commercial thinning treatments. This impact is considered moderate, given the connectivity emphasis which has been placed on this area (USDA/USDI 2001).

Fisher (Candidate and Bureau Sensitive)

Fishers have been found approximately four miles south of the Resource Area boundary, and approximately ten miles southwest of the analysis area boundary. Under Alternative 4, the action would remove 226 acres of currently suitable, closed canopy forest, a reduction of approximately 1% of the remaining late-successional habitat in the watershed. The project would retain all downed wood cover, all riparian habitat, and 6-8 trees per acre. Some potential

den sites may be lost. The consequences of these impacts on individual fishers in the project area or the population as a whole are not known. Some reduction in movement corridors for fisher in or adjacent to the project is likely. The extent of this reduction on the overall habitat conditions of fishers is unknown. 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 (Appendix J-2, USDA/USDI 1994). This project would not change the trend predicted in the NFP.

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Since the known Townsend's big-eared bat adits would be protected from timber harvest with a 250' buffer, and also with a 100' buffer for fuels treatments, it is expected the microclimate would be largely unaffected by proposed activities. It is also expected fuels treatments would reduce the chance of stand-replacement wildfire, thus benefiting the microclimate adjacent to the adits.

Northern Goshawk (Bureau Sensitive)

Impacts to raptors, including goshawks, were analyzed in the RMP (USDI 1995), and effects from this project are within the scope of that analysis. Although limited surveys in the analysis area have thus far not documented this species, it has been found to be nesting in the western portion of the watershed, and is therefore expected to occur in suitable habitat in the analysis area. Goshawks prefer to nest in the largest oldest conifer stands. Under this Alternative, 226 acres of currently suitable closed canopy forest would be removed, and can be expected to no longer provide goshawk habitat.

Western Pond Turtle (Bureau Sensitive)

Since western pond turtles inhabit ponds and slow-moving water in the forested matrix, with proposed treatments occurring outside riparian reserves it is anticipated there would be little effect on pond turtles in this Alternative.

Cumulative Effects on Late-Successional Habitat

Past timber harvest on both federal and private lands in the central portion of the Grave Creek watershed, where the project area occurs, has left a highly fragmented landscape which has substantively reduced both the quality and quantity of late-successional habitat. The current proposal includes additional timber harvest in the area of past harvest, resulting in direct cumulative effects of a moderate level of impact. Under Alternative 4, there would be no irretrievable commitment of resources as a result of permanent road construction.

4.7 Effects on Special Status Plant Species and Habitat

Bureau Special Status Species policy for sensitive species require that BLM districts 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 may, 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.

In general, buffers would provide protection to special status plant populations which are found in forested habitats. These species could be impacted by timber harvest, pile burning and/or other ground disturbance, and buffers would protect interior forest microclimate at the site(s). No adverse effects are anticipated to bureau sensitive or assessment species.

Microclimate measurements show that interior conditions may not be found until 100 to over 790 feet from clearcuts or agricultural fields, depending on site conditions and weather, and the variable measured (Chen 1991, Rodrigues 1998). Some of the smaller microclimate differences appear to be irrelevant to biological systems, as edge effects on biological variables, such as plant regeneration and species composition, generally average around 200 to 250 feet, with a range of 50 to 450 feet, adjacent to cleared areas (Chen 1991, Rodrigues 1998, Jules 1997).

Regeneration harvest units would retain about 10-15% canopy cover, lessening the depth of edge effects. Thinning prescriptions retain up to 60% canopy. Based on numbers in the literature, modified by consideration of the prescriptions, plant sites in regeneration cuts or similar cuts that retain less than 40% canopy should have 200 foot buffers, and others should be 100 feet.

Considering species associated with non-forested habitats reside within units slated for prescribed burning, buffer width would be sufficient enough to preclude hand piles from being placed directly on top of the plant(s). Burning would generally not be done in buffers, as some plants would be killed by direct heat. However, within populations of plants occurring in open areas, such as *Camassia howellii* and *Silene hookeri* var. *bolanderi,* underburning is permissible in the fall or winter, before March 15, as these plants are still dormant during this time. For nonvascular plants which occur in open areas, protection would be determined on a site by site basis, and would largely depend on the substrate involved.

No effects would occur to the endangered plant *Fritillaria gentneri*. No populations were found in the planning area.

Direct Effects on Botany

Alternative 1 (No Action Alternative)

Under the No Action Alternative, ecological processes would continue undisturbed.

Action Alternatives (alts 2, 3, 4)

Buffers would occur around those Bureau Sensitive species located within forested units which would be impacted by timber sale activity. Buffers would provide protection to known plant populations and no adverse effects are anticipated. For Bureau Sensitive species occurring in more open habitats, and which have exhibited a benign or positive response to prescribed fire activity, underburning may occur within the designated timeframe. Bureau Assessment species would be assessed on a site-to-site basis to determine buffer necessity and buffer size.

Underburning of *Camassia howellii* and *Silene hookeri* var. *bolanderi* sites can occur on an experimental basis, with monitoring to occur afterwards. Spring burning should not occur, to avoid burning green shoots, while fall burning should only be done after the lower layers of the duff layer are wet, to avoid killing the dormant underground portions (bulbs and caudices). These species should resprout from bulbs or caudices after underburning and therefore no adverse effects are anticipated. The reduction of brush and small tree cover would benefit these species by reducing shading and competition.

BLM Manual 6840 requires that actions on BLM lands do not contribute to the need to list Special Status species under the Endangered Species Act. For the Special Status species that are Bureau Tracking, surveys and mitigation measures are discretionary (BLM Manual 6840).

Indirect Effects

There are two potential indirect effects pertaining to Bureau Special Status (BSS) plants – noxious weeds and cumulative effects. If left unchecked, noxious weeds, which tend to take advantage of newly disturbed areas, would increase competition and might displace some BSS species.

The second is potential indirect effect is cumulative effects, which includes past activities such as clearcutting, road building, mining, and private land development, on federal and non-federal lands. These activities, particularly on private lands, have likely adversely affected special status species occurrences. Currently, no laws exist which require protection of Special status plants on privately owned land, with the exception of public lands managed by the State and Federal government. Future activities on federal and State public lands would likely conserve existing special status occurrences. However, unmanaged rare plant occurrences on non-federal lands would likely experience adverse effects from future land uses and development.

4.8 Effects on Fish/ Streams/ Riparian Habitat/Soils

Alternative 1 (No Action)

There would be no short-term addition of sediment to streams because there would be no road renovation. However, the beneficial long-term effects of reducing stream sedimentation by improving road drainage would not occur as they would under the action Alternatives. 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. This would result in allowing some roads to continue to degrade and contribute sediment to important salmon, steelhead and cutthroat trout streams. No roads would be built or decommissioned.

Alternative 2

Table 4-2. Summary of Harvest and Road –related Actions by Alternative in each 6th field watershed. Numbers in bold represent acres within the transient snow zone.

	Grave Creek –Sunny Valley HUC 6			
	Alternative 1 (No action)	Alternative 2	Alternative 3	Alternative 4
Harvest Type (acres) RH CT 40% 60% SC SC (60% canopy Small diameter Total Acres	None	165 (24%) **48** 468 (65%) **18** 59 (9%) **22** 16 (2%) 708	165 (24%) **48** 423 (60%) **18** 45 (5%) 59 (9%) **22** 16 (2%) 708	121 (18%) **6** 423 (60%) **18** 45 (5%) 59 (9%) **22** 44 (5%) **42** 16 (2%) 708
Roads (miles) Construction permanent temporary Decommissioning	None	 0.25 (1 road) 0.55 (3 spurs) 0.55 (1spur - riparian)	 0 0.55 (3 spurs) 0.55 (1 spur - riparian)	 0 0.55 (3 spurs) 0.55 (1 spur - riparian)

Table 4- 3.

	Grave Creek –Placer HUC 6			
	Alternative 1 (no action)	Alternative 2	Alternative 3	Alternative 4
Harvest Type (acres) RH CT 40% 60% Total Acres	None	 46 (39%) 73 (61%) **38** 119	 46 (39%) 28 (24%) **38** 45 (37%) 119	 0 73 (100%) **38** 73
Roads (miles) Construction permanent temporary Decommissioning	None	 0.1 (1 spur)	 0.1 (1 spur)	 0.1 (1 spur)

Table 4- 4

	Wolf Creek HUC 6			
	Alternative 1 (no action)	Alternative 2	Alternative 3	Alternative 4
Harvest Type (acres)	None			
RH		99 (22%) **29**	99 (22%) **29**	69 (15%) **29**
RH/GS		15 (3%) **2**	15 (3%) **2**	15 (3%) **2**
RH/OR		21 (5%) **21**	21 (5%) **21**	21 (5%) **21**
CT				
40%		280 (63%) **27**	280 (63%) **27**	280 (63%) **27**
SEL		31 (7%) **6**	31 (7%) **6**	31 (7%) **6**
SEL(60% canopy closure)				30 (7%)
Total Acres		446	446	446
Roads (miles)	None			
Construction				
permanent		2.1 (2 roads)	0	0
temporary		0.1 (1 spur)	0.1 (1 spur)	0.1 (1 spur)
Decommissioning		0.3 (2 spurs)	0.3 (2 spurs)	0.3 (2 spurs)

Riparian reserves at least 300 feet wide (each side) of fish-bearing streams (unit 33-13) and a minimum of 150 feet wide on non-fishery streams would maintain water temperature and effectively prevent any loose soil that is generated by timber felling and log yarding activities from reaching streams. No harvest or site preparation is planned in riparian reserves.

Log hauling would not result in soil erosion or contribute sediment to streams because it would be limited to the dry season (Table 2-4). Undisturbed ground at the bottom of harvest units would capture any overland flow and sediment from cable yarding routes during the wet season.

Although road renovation can reduce and minimize movement of soil to streams in the longterm if its done on a regular basis, it often contributes a short pulse of sediment during the first major storm event during late fall when streamflow increases and mobilizes soil that remains in the stream channel following culvert inlet cleanout or replacement. The amount of sediment input would be minimal because appropriate PDFs would be used (EA, Section 2.2.10) to lessen the amount of disturbance. Levels of suspended and bedload sediment more than several hundred yards downstream of renovated roads would be indistinguishable from background levels (natural and human-caused sources). Potential for short adverse effects on aquatic life would be greatest immediately downstream of road crossings and diminish rapidly with increasing distance from the road as bedload and suspended sediment is gradually diluted by tributaries and transported downstream. Crossdrain culverts and rocked water dips that are added to haul roads would route most sediment-laden water off the road onto the forest floor where it would be filtered of soil before eventually reaching stream channels through subsurface flow.

Building temporary roads under the current proposal would not degrade water quality and stream habitat since they would be located on or near ridgetops, on stable ground or far from any streams. Barricading and gating roads (Table 2-4) would eliminate vehicle use and potential erosion of unsurfaced roads during winter.

Constructing 0.25 miles of permanent road into unit 32-1 (road 33-6-33) and decommissioning 0.55 miles of existing road in riparian reserve (road 34-6-3.1C) would result in a slight net decrease in road density in the Grave-Sunny Valley HUC 6 (current density in the HUC 6 is 5.0 miles per square mile). Work in stream channels would contribute pulses of sediment to small streams that flow into Mackin Gulch and Brushy Gulch during the first major fall storm following the disturbance. Both streams flow into Grave Creek.

Constructing 2.1 miles of permanent road (roads 33-5-18 #1 and 33-5-18 #2) into units 13-2 and 19-3 and decommissioning 0.3 mile of existing road would result in net increase in road density in the Wolf Creek HUC 6 (current density in the HUC 6 is 4.1miles per square mile. Construction and decommissioning would contribute pulses of sediment to Coyote Creek during the first major fall storm following the disturbance.

There is no road construction or decommissioning in the Grave Creek-Placer HUC 6.

Several streams provide habitat for southern Oregon/northern California coho salmon, an ESA-threatened species. Any bedload sediment that reaches coho habitat from road construction, renovation or decommissioning is unlikely to adversely affect the species or its critical habitat in Grave Creek, Wolf Creek and Coyote Creek because appropriate PDFs (EA, Section 2.2.10) would be used to minimize the amount of soil that enters stream channels and sediment would be diluted immediately by much higher flow in all three streams. For instance, nearly 48,000 acres of watershed contribute to streamflow in mainstem Grave Creek above the Flume Gulch/Mackin Gulch/Brushy Gulch vicinity. More than 5100 acres of watershed contribute to flow in Coyote Creek above the confluence of Foley Gulch watershed where sediment could be contributed from road construction. Frequent wildfire in this watershed, followed by intense rainstorms, has historically been the primary contributor of sediment to steams. Any sediment that the streams contribute to Grave Creek as a result of the proposed action would be probably well within conditions of natural disturbance (Grave Creek Watershed Analysis, p 27).

Replacing a deteriorating and undersize culvert in mainstem Flume Gulch would restore passage for cutthroat trout and protect road integrity during peak flows. Sediment that enters Flume Gulch during culvert replacement would not adversely affect coho salmon habitat 1.2 miles downstream in lower Flume Gulch or in Grave Creek (2 miles downstream) because soil disturbance would be minimized by using appropriate PDFs (EA, Section 2.2.10). While some sediment may be stored in the stream channel, most would probably be transported downstream over an extended period of time and diluted by flow from several small tributaries between the worksite and Grave Creek. Any sediment that reaches Grave Creek would be diluted immediately by much higher stream flow originating from nearly 47,700 acres of watershed above Flume Gulch.

It is highly unlikely that harvest would measurably increase peak flow at the HUC 6 scale because (a) at least 73% of all acres and at least 82% of TSZ acres in the three HUC 6 watersheds (Tables 4-5 and 4-6) are functioning properly from a hydrology perspective since

they have not been measurably disturbed through timber harvest or wildfire in nearly 30 years. Vegetation is generally considered to be in an advanced stage of hydrologic recovery after 20 years and substantially complete by age 30 (Harr 1989; Jones 2000) (b) proposed harvest units are spread across each HUC 6 in many small watersheds (c) the Alternative would increase the amount of recently disturbed acres in each 6th field watershed by 1 to 3% (Table 4-5) and across TSZ acreage by 0 to 6% (Table 4-6). The 6% increase in TSZ openings would not lead to higher peak flows because the TSZ comprises only 6% of this entire 6th field watershed (d) most harvest would be commercial thin, retaining at least 40% canopy closure and resulting in less chance of harvest leading to higher peak streamflow than RH. It's also highly unlikely that the proposed action would physically alter any stream or riparian characteristics (Table Appendix B) because appropriate PDFs would be used to set riparian reserve widths and to restrict felling and yarding. It is expected that canopy condition and hydrologic recovery in commercial thin units (40%canopy closure) would return to baseline (pre-harvest) conditions within 5 to 10 years, RH/OR within 15 years, 15 to 20 years for selection harvest and 20 to 30 years in RH units. RH/GS and selection harvest with 60% canopy would have no effect on hydrologic response of small watersheds because of the nature of the treatments (EA, Section 2.3.3). Effects of historic wildfire resulted in far greater acreage in open condition (no or minimal ground cover or canopy closure) and higher peak flows in the Grave Creek watershed than at present (Grave Creek WA). Existing stream channel capacity reflects peak flow conditions under historic wildfire regimes (Harr 1989); high road density can increase the magnitude of peak flows beyond the range of natural variability, however.

Table 4- 5. Comparison of the effect of timber harvest on vegetation (hydrologic) condition on <u>all acres</u> **in each 6th field watershed and in the Benjamin Gulch 7th field subwatershed.**

Watershed	Alternative 1 (baseline)	Alternative 2	Alternative 3	Alternative 4
	Vegetation Condition*	Vegetation Condition **	Vegetation Condition**	Vegetation Condition**
Grave-Placer HUC 6 (12,792 ac)	80% (10,222 ac)	79 % (10,103)	79% (10,103)	80% (10,177)
Grave-Sunny Valley HUC 6 (19,572 ac)	73 % (14,373 ac)	70% (13,681)	70% (13,681)	70% (13,784)
Wolf HUC 6 (28,343 ac)	80 % (22,794 ac)	79% (22,363 ac)	79% (22,363 ac)	79% (22,433)
Benjamin Gulch HUC 7 (950 ac)	78% (742 ac)	75% (714 ac)	75% (714 ac)	78% (742)
Brushy Gulch HUC 7 (1226 ac)	83% (1013 ac)	79% (969 ac)	79% (969 ac)	83% (1013 ac)

(*) Landsat remote sensing technology was used to determine the percentage of each 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; Jones 2000). (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 non-forest lands comprise 6 to 11% of all acres in each HUC 6 and are included in baseline (Alt 1) and post-harvest calculations (Alternatives 2 through 4). Openings that appeared between 1974 and 2002 are in various stages of hydrologic recovery. Therefore, estimated percent of acres in proper hydrologic functioning baseline condition are **minimums**.

** 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, 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. RH/GS, CT (60%canopy retention), and Select harvest (60 % canopy) treatments retention would have no effect on hydrologic response of small watersheds because of the "light touch" nature of the treatments (EA, Section 2.3.3). Refer to Tables 4-2, 4-3 and 4-4 for acres of harvest type in each HUC 6 watershed.

Table 4- 6. Comparison of the effect of timber harvest on vegetation (hydrologic) condition on TSZ acres in each 6th field watershed and in the Benjamin Gulch and Brushy Gulch HUC 7 subwatersheds.

Watershed	Alternative 1 (baseline)	Alternative 2	Alternative 3	Alternative 4
	Vegetation Condition*	Vegetation Condition **	Vegetation Condition**	Vegetation Condition**
Grave-Placer HUC 6 (5853 ac)	82% (4821 ac)	82% (4783 ac)	82% (4783 ac)	82% (4821 ac)
Grave-Sunny Valley HUC 6 (1225 ac)	83% (1015 ac)	77% (949 ac)	77% (949 ac)	81% (991 ac)
Wolf HUC 6 (7297 ac)	82% (5991 ac)	81% (5914 ac)	81% (5914 ac)	81% (5914 ac)
Benjamin Gulch HUC 7 (354 ac)	80% (284 ac)	73% (261 ac)	73% (261 ac)	80% (284 ac)
Brushy Gulch HUC 7 (84 ac)	61% (51 ac)	33% (28 ac)	33% (28 ac)	61% (51 ac)

(*) Landsat remote sensing technology was used to determine the percentage of each 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; Jones 2000). (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. These open, compacted non-forest lands comprise 6 to 11% of all acres in each HUC 6 and are included in baseline (Alt 1) and post-harvest calculations (Alternatives 2 through 4). Because openings that appeared between 1974 and 2002 are in various stages of hydrologic recovery the estimated percent of acres in proper hydrologic functioning baseline condition are **minimums**.

** 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,CT and SC (10-25 tpa) units are given equal weight in this analysis, although the amount of residual vegetation would be considerably greater following CT than after RH. RH/GS, CT (60% canopy retention), and SC harvest (60% canopy retention) treatments would have no effect on hydrologic response of small watersheds because of the "light touch" nature of the treatments treatments (EA, Section 2.3.3). Refer to Tables 4-2, 4-3 and 4-4 for acres of harvest type in each HUC 6 watershed.

Although its unlikely that the plan for timber harvest under this Alternative would increase peak flow at any HUC 6 watershed scale, it is possible that harvest in Benjamin Gulch (in the Grave – Placer HUC 6) and in upper Brushy Gulch (in the Grave –Sunny Valley HUC 6) could incrementally increase peak flow and contribute to bank instability because a high percentage of the transient snow zone would be in open condition (Table 4-6). High road density (4.3 miles per square mile) in combination with numerous recent clearcuts on private and BLM lands (none with Forest Plan riparian reserves) may be increasing runoff during storm events and may be beginning to destabilize streambanks in the Benjamin Gulch HUC 7. In addition to proposed harvest under this timber sale, 34 acres in Benjamin Gulch would be harvested as part of the Serpents Grave timber sale (15 ac OR, 16 ac CT and 3 ac RH). Plus, much of this small watershed at lower elevation is agricultural land, which is always in hydrologic unrecovered condition. Thirty acres of proposed RH harvest in upper Brushy Gulch immediately upslope of 40 acres that are in initial stages of hydrologic recovery would create a 70 acre clearcut that could have the same environmental effects that are projected for Benjamin Gulch.

Any increase in peak flow or streambank erosion in Brushy Gulch or Benjamin Gulch would probably be undetectable in Grave Creek (coho critical habitat) because of Grave Creek's much higher streamflow (specifically, nearly 33,000 acres [52 square miles] of watershed contribute to streamflow in mainstem Grave Creek at its confluence with Benjamin Gulch. About 48,000 acres of watershed contribute to Grave Creek streamflow at its confluence with Brushy Gulch. Any sediment that these streams contribute to Grave Creek as a result of the proposed action would be probably well within conditions of natural disturbance (Grave Creek Watershed Analysis, p 27) but could still adversely affect aquatic life in both of these small streams.

It is unlikely that baseflow in small, headwater streams (1st, 2nd and 3rd order) that are adjacent to most harvest units would increase following harvest because fully vegetated riparian reserves (one site potential tree height in width) would probably utilize any groundwater that was excess to needs of residual vegetation in a recently harvested and site- prepped harvest unit immediately upslope. Flow in small streams adjacent to harvest units could actually decrease somewhat for several years as rapidly growing conifers, hardwoods and shrubs reoccupy the harvested site. Potential for changes in baseflow in small perennial streams would be greatest next to RH units and least where there has been select cut, group selection or commercial thin.

It is also unlikely that any activity other than harvest (i.e. log yarding and hauling, temporary road construction or road renovation, construction, decommissioning, gating, barricading or site preparation) would have any effect whatsoever on peak or base flows because either there is no inherent mechanism for the activities to affect streamflow. Road 33-5-16 #1 to unit 13-2 has little potential for increasing peak flow because it would be outsloped and would intercept little if any groundwater flow because of its proximity to a ridge.

Soils

Activities proposed under this Alternative would cause soil displacement, compaction and loss of productivity on ground that is associated with landings, cable yarding and construction of temporary roads. However, implementing Best Management Practices (BMPs) in Appendix D of the RMP EIS (RMP, 1995) should prevent unacceptable degradation of the soil resource (RMP EIS Volume 1 page 4-12).

Cable harvesting of RH units would result in slight compaction on about 6% of each harvest unit and on 3% of each CT unit. As mentioned in the PDFs, helicopter landings would be subsoiled and planted after harvest. Movement of soil from cable yarding routes is unlikely because it would be trapped by logging slash or filtered by vegetation on undisturbed ground.

Sub-soiling roads that are to be decommissioned and helicopter landings would increase potential for soil movement but it would not contribute to stream sedimentation because areas to be subsoiled would also be waterbarred, seeded and mulched during the dry season. There would be minimal loss of soil productivity following subsoiling since nutrients would still be available for reestablishment and growth of vegetation. Subsoiling temporary roads, decommissioned roads and helicopter landings would help restore the natural hydrologic regime by increasing moisture infiltration rate during storm events and it would result in a net gain in production potential of the sites.

Fuels treatments and small diameter harvest would have no measurable effect on watershed hydrology, soil erosion or stream sedimentation because adequate PDFs would be implemented to ensure that adverse effects to the environment do not occur (EA, Sections 2.2.1 and 2.2.9.1). Pile and burn or broadcast burning would reduce the amount of organic litter but not destroy the organic (decomposed and usually wet at the time of the burn) horizon when burn guidelines are implemented as planned. Therefore site productivity should be maintained in the long term.

Alternative 3

Forty five acres of CT in Unit 5S-1 would change from 40% canopy retention to 60% canopy retention. There would be slightly less chance that a rain-on-snow storm event would measurably increase peak flows in streams adjacent to the harvest unit.

Road construction would not contribute sediment to Foley Gulch, Coyote Creek, Brushy Gulch and Grave Creek because the roads would not be built.

Other effects would be the same as in Alternative 2.

Alternative 4

There would be 120 fewer acres of regeneration harvest and 28 more acres of CT with 60% canopy retention in this Alternative than in Alt 3. This would lessen potential for harvest in Benjamin Gulch and Brushy Gulch to result in higher peak flows and streambank erosion. Two additional fuel units would be added to this Alternative: 5S-1 and 5S-3.

Other effects would be the same as in Alternative 3.

Summary effects of Alt, 2,3,4

There would be a slightly higher potential for timber harvest to increase peak flows in some small, non fish-bearing streams in Alternative 2 because (1) only 40% forest canopy would be retained during commercial thinning in the transient snow zone in Benjamin Gulch rather than 60% in Alternative 4 and (2) there would be RH in the headwaters of Brushy Gulch under Alternatives 2 and 3 rather than retaining 60% canopy closure in Alternative 4. Short term contribution of sediment to streams from road construction and decommissioning would be slightly higher in Alt 2 than in Alts 3 and 4 because of 2.35 miles of new, permanent road construction. Longterm benefits of reducing stream sediment by renovating and decommissioning roads would be the same in all Alternatives. Any increases in peak flow, at the HUC 6 watershed scale in all action Alternatives, would probably be immeasurable. Additionally, no factor in the National Marine Fisheries Service Matrix of Pathway Indicators (NMFS 1996) for fish habitat would be degraded in the short or long term in the any of the HUC 6 watersheds (Appendix B). This project is consistent with the Aquatic Conservation Strategy objectives because proposed actions at the project scale (HUC 6) would have insignificant and immeasurable effects on quality of aquatic and riparian habitat at the HUC 5 watershed scale of analysis

Essential Fish Habitat

A description of the proposed action appears in Chapter 2 of this document.

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 coho and chinook salmon (Federal Register, Vol. 67, No. 12). 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)."

Table 4- 7. Estimated miles of Essential Fish Habitat (Magnuson-Stevens Act) within the Five Rogues Timber Sale project area.

Stream Name	Miles of EFH for coho salmon*	Miles of EFH for chinook salmon
Grave Creek	8.5	8.5
Flume Gulch	0.9	-
Wolf	3.1	-
Coyote	4.6	-

Activities associated with the 5 Rogues Timber Sale would have no adverse effect on EFH for coho and chinook salmon because of the **reasons already discussed.** Effects on EFH would be

minimized or prevented by incorporating PDFs (EA, Section 2.2) in accordance with the Northwest Forest Plan and the Medford District RMP Record of Decision.

Cumulative Effects

Cumulative effects of the action Alternatives would be minimal and undetectable at the HUC 5 watershed scale. Watershed area of Grave Creek upstream of the Action Area has a major influence on peak flow and stream sediment within and downstream of the timber sale area. Effects of any of the action Alternatives on fish and other aquatic species within the basin would be immeasurable because BMPs (RMP) and PDFs (EA, Section 2.2) would be used to minimize any adverse effects to the environment.

Although road renovation and decommissioning are important for attempting to restore the natural sediment regime to the watershed, the magnitude of proposed activities is small compared to total HUC 5 acreage so it would not noticeably improve or degrade water quality or the quality of aquatic habitat at the HUC 5 watershed scale. There would be no meaningful change in the HUC 5 road density because of the minor amount of decommissioning and permanent road construction.

Since the proposed cutting units are spread across the entire project area and because proposed harvest acreage is relatively small compared to the HUC 5 watershed area, any hydrologic effects of the proposed action would be undetectable at the HUC 5 watershed scale. Any local hydrologic effect would diminish annually as vegetation recovers in harvest units.

Logging and other ground disturbing activity continue at a steady pace on private lands in and around the Planning Area. Much of the logging occurs with tractor throughout the year. As a result, sediment is generated from tractor yarding and log hauling during wet weather. Much of the riparian habitat along streams in the HUC 5 is under private ownership (47%) and does not support vegetation that is needed for stream and riparian integrity as described in the Northwest Forest Plan. It is expected that activities on private lands would continue to maintain aquatic and riparian habitat in degraded condition. However, stream sedimentation and water temperature increases from operations on private lands may decrease somewhat in the future as lands are logged over for the second time and vegetation re-establishes.

The following BLM timber sales have been logged in the Grave Creek watershed in the recent past:

PP &J
Serpents Grave
Poor Angoras Folly
I-Shank
Burgess Gulch
King Wolf
Coyote Pete
Low Five
High Five

Other federal Actions:

Clark Creek Road decommissioning (1.3 miles) – 1997
Last Chance Creek fish passage improvement (replace 2 culverts) - 1999
Last Chance Creek watershed road decommissioning (1.1 miles) - 1999
Shanks Creek Road drainage improvement (3 miles) – 2001
Road decommissioning (miscellaneous) (4.7 miles) - 2002
McCoy Creek road renovation (5 miles) – 2003
Wolf Creek culvert replacement (safety issue and road integrity) - 2003
Slate Creek fish passage improvement (culvert replacement) - 2003

4.9 Effects on Visual Quality

The RMP identifies Visual Resource Contrast Rating System would be used during project level planning to determine whether or not a proposed activity would meet given VRM objectives. The Visual Resource Contrast Rating System worksheets are contained within the project analysis file.

Alternative 1 (No Action)

Regardless of no action from the BLM on federal lands, the continued clear-cutting of private forest lands would have a substantial effect on the future quality of the visual resources within the I-5 corridor. The checkerboard ownership pattern has led to a fragmented scenic quality in this corridor.

Action Alternatives (alts 2, 3, 4)

VRM Class II
Most of the proposed units located in VRM Class II lands would have some affect on the Interstate 5 viewshed. The units proposed to have commercial thinning would be managed to leave 40-60% of the canopy after harvest. This low level activity should not attract the attention of the casual observer traveling Interstate 5.

The proposed fuels reduction units would have some impact on the viewshed because ground cover would be reduced and a slightly more transparent forest would remain. However, this activity would be a short term effect and should not be noticeable by the casual observer traveling Interstate 5.

Unit 13-3 group selection cuts would be irregularly shaped and elongated to match the existing surrounding the 13-3 groups. There would be a short term effect that could attract the attention of the casual observer, however, in the long term, hardwoods would fill in the harvested areas and would blend into the existing characteristic of the landscape.

Units 35-2,3,5,6,7 are located in a proposed interpretive recreation site (analyzed under the Salmon Creek Interpretive Forest environmental analysis). The desired future condition fot that Forest is to leave a 50-60 % canopy after harvest and to leave a 100’ buffer of existing stand condition are on either side of proposed recreational trails and along the entrance road to the recreation site.

VRM Class III

The current landscape surrounding most of the units located on VRM Class III lands consist of a mosaic of previously entered lands affected with clear-cutting on private lands and some mixed conifer and hardwood forests. The majority of Five Rogues units are located directly on the boarders of previous clear-cuts units in varying degrees of re-growth, with some of the units being completely surrounded by clear-cuts. These clear-cuts currently dominate the view of the casual observer.

Units 18-1, 2, 7, 8, 9 are proposed for regeneration, selective, or group selection harvests and are located within area described as mature/old growth forest within matrix lands. VRM Class III may have moderate levels of change to the landscape and may attract attention from the casual observer however activities should not dominate the view of the casual observer. The proposed harvest methods in this area, due to the existing landscape, could dominate the view of the casual observer residing or traveling in the Speaker Road area, but not to those traveling I-5. Additionally, Unit 18-1 would be harvested with irregularly shaped and elongated boundaries to lessen visual impacts to the casual observer.

In Unit 10-1, the south facing and ridgeline areas proposed for regeneration harvest can be seen from the town of Wolf Creek as well as from the London Peak Trail Overlook and could attract the attention of the casual observer.

Under Alternative 2, the new road construction in sections 13 and 18 could dominate the view of the casual observer who travels in that area on the forest roads. Alternatives 3 and 4 do not propose this road.

The temporary road construction located in Unit 9-1 could dominate the view of the casual observer traveling in that area on forest roads on a short term basis. However, this road would be returned to its natural condition after Unit 9-1 is harvested. No long term visual effects are anticipated.

VRM Class IV

All proposed harvest methods on units located on VRM Class IV would meet objectives of VRM Class IV guidelines as stated in the Medford District RMP.

Mitigation measures. Potential treatment units considered effects under the three VRM classifications. However, the identifies that harvest units 18-1, 2,7,8 and 9 have the potential to dominate the view of the casual observer. Mitigation measures include reducing the size of the units or retaining additional leave trees. Unit 35-2 should be feathered with a 100’ buffer from the south boundary along the existing private residential land.

Cumulative Effects: Alternatives 2, 3, 4

All proposed harvest actions related to the 5 Rogues planning area would have a slight to moderate increased visual impact to travelers on Interstate 5, to tourists visiting the historic Wolf Creek Inn and the Applegate Trail Museum, and to residents of the Wolf Creek and Sunny

Valley areas. Existing and future private land clear-cutting would continue to have a visual impact on the residents and travelers in, and through this area.

4.10 Recreation

Alternative 1 (No Action)

There are no anticipated recreational effects from Alternative 1; however, with the continuing harvest of private forested lands demands for future forest-related recreation opportunities would increase placing the demand for these opportunities to be located on public lands.

Action Alternative (alts 2, 3, 4)

Direct Effects

Some impact would occur to visitors traveling on road 33-6-26 to the London Peak Barrier Free Trail due to the commercial thin harvest of Unit 27-1. Some traffic interferences or congestion may occur during the harvest period at this unit but would be mitigated with the proper use of road hazard or temporary closure signage at the entrance to this road from Bridge Lane in Wolf Creek. The viewshed from the London Peak Trail Overlook would also be impacted due to the Planning Area's proposed activities (see Visual Resource Management section of this EA).

There would be increased truck traffic in and around the towns of Wolf Creek and Sunny Valley during the high visitor use season. Again, good roadside signage would assist in lessening any possible traffic issues in these areas. Additionally, the Grave Creek Covered Bridge has weight and height limits truck traffic around the town of Sunny Valley on the Leland Road by-pass thus alleviating possible traffic issues with visiting tourist during the proposed harvest season.

Some effects to the proposed Salmon Creek Interpretive Forest would occur through harvest in Units 35-2, 3, 5, 6, 7.

Cumulative effects

There would be little recreational use cumulative effects to the recreation environment from this proposal; however, with the continuing harvest of private forested lands demands for future forest-related recreation opportunities increase placing the demand for these opportunities to be located on public lands.

Chapter 5 – List of Preparers

5.1 Agencies and Persons Consulted

A legal advertisement will be placed in local newspapers to announce to the public that the Glendale Resource Area is requesting public comments on the proposed management action. The EA will also be available for review at the BLM Medford District Office, the Medford District's web site (www.or.blm.gov/Medford/planning) or by request. In addition, notification of this proposal will be sent to the Oregon Department of Fish and Wildlife, the Oregon Dept. of Forestry, county commissioners for the affected county, several environmental groups, and representatives of the timber industry to request their comments. These announcements will be made following completion of this environmental assessment and before a decision is made.

A 30 day comment period will begin after public notification in the local newspapers. Comments, including names and street addresses of respondents, will be available for public review. Individual respondents may request confidentiality. If you wish to withhold your name or street address from public review or from disclosure under the Freedom of Information Act, you must state this prominently at the beginning of your written comment. Such requests will be honored to the extent allowed by law. All submissions from organizations or businesses, and form individuals identifying themselves as representatives or officials of organizations or businesses, will be made available for public inspection on their entirety.

5.2 List of Interdisciplinary Preparers

Name	Title	Primary Responsibility
Dave Eichamer	Forester	Special Products-small diameter
Mike Main	Fuels Specialist	Fuels, Air Quality
Michael Bornstein	Wildlife Biologist	Wildlife, T/E Animals
Dave Hutton	Forester	Silviculture, Logging systems
Martin Lew	Ecosystem Planner	NEPA
Delbert Longbrake	Engineer	Roads
Rachel Showalter	Botanist	Botany
Bob Bessey	Fish Biologist	Soils, Hydrology and Fisheries
Katie Wetzel	Recreation Planner	Visual Quality, Recreation

Reviewed By:

Martin Lew — 5/25/04

Glendale RA Ecosystem Planner — Date

Reviewed for format and adequacy

Lynda Boody — Date

Area Manager, Glendale Resource Area

Medford District, BLM

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
ESA	Endangered Species Act
LSR	Late Successional Reserve
MBF	Thousand Board Feet
NEPA	National Environmental Policy Act
PCT	Precommercial Thinning
Special Status	Endangered, Threatened and Sensitive
S&M	Survey and Manage

Air Quality. Refers to standards for various classes of land as designated by the Clean Air Act, P.L. 88-206, Jan. 1978.

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)).

Biodiversity or Diversity. The relative distribution and abundance of different plant and animal communities and species within an area.

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 20 inches in diameter.

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

Compaction (relative to this EIS). Refers to soil becoming consolidated by the effects of surface pressure often from heavy machinery or vehicle and pedestrian traffic.

Connectivity. A measure of the extent to which conditions between late-successional/old-growth forest areas provide habitat for breeding, feeding, dispersal, and movement of late-successional/old-growth-associated wildlife and fish species.

Cover. Vegetation used by wildlife for protection from predators, or to mitigate weather conditions, or to reproduce. May also refer to the protection of the soil and the shading provided to herbs and forbs by vegetation.

Cultural Resources. The physical remains of human activity (artifacts, ruins, burial mounds, petroglyphs, etc.) having scientific, prehistoric or social values.

Cumulative Effect. The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can also result from individually minor, but collectively significant actions taking place over a period of time.

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

Ecosystem. The complete biological and abiotic system formed by the interaction of a group of organisms and their environment.

Edge. Where different plant communities meet, or where variations in successional stage or vegetation conditions within the plant community come together.

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.

Emissions. Substances discharged into the air, such as from tractors and trucks..

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.

Floodplain. The lowland and relatively flat area adjoining inland and coastal waters, including, at a minimum, areas that are subject to a one percent or greater chance of flooding in any given year.

Forage. All browse and non-woody plants that are available to livestock or game animals and used for grazing or harvested for feeding.

Forest Health. The ability of forest ecosystems to remain productive, resilient, and stable over time and to withstand the effects of periodic natural or human caused stresses such as drought, insect attack, disease, climatic change, flood, resource management practices and resource demands.

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.

Habitat Type. (Vegetative). An aggregation of all land areas potentially capable of producing similar plant communities at climax.

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

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

Indirect Effects. Secondary effects which occur in locations other than the initial action or significantly later in time.

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.

Issue. A point, matter, or question of public discussion or interest, to be addressed or resolved through the planning process.

Landscape. A heterogeneous land area with interacting ecosystems that are repeated in similar form throughout.

Late Successional Forests. Forest seral stages which include mature and old-growth age classes of trees.

Mitigation. Mitigation includes (1) avoiding the impact altogether by not taking a certain action or parts of an action; (2) minimizing impacts by limiting the degree or magnitude of the action and its implementation; (3) rectifying the impact by repairing, rehabilitating, or restoring the affected environment; (4) reducing or eliminating the impact over time by preservation and

maintenance operations during the life of the action; and (5) compensating for the impact by replacing or providing substitute resources or environments.

Monitoring. The process of collecting information to evaluate if objectives and anticipated or assumed results of a management plan are being realized or if implementation is proceeding as planned.

National Ambient Air Quality Standards (NAAQS). Standards designed to protect public health and welfare, allowing an adequate margin of safety. For particulate matter less than ten microns in size (PM10), 50 micrograms per cubic meter annual average and 150 micrograms peer cubic meter, 24-hour average; not to be exceeded more than once per year.

National Environmental Policy Act of 1969. This law requires the preparation of environmental impact statements for every major Federal Action which causes a significant effect on the quality of the human environment.

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.

Non-attainment. Failure of a geographical area to attain or maintain compliance with ambient air quality standards.

Noxious Weeds. Rapidly spreading plants that can cause a variety of major ecological or economic impacts to both agriculture and wildland.

Old-growth. A forest stand usually at least 180-220 years old with moderately high canopy closure; a multi-layered, multi-species canopy dominated by large overstory trees; high incidence of large trees, some with broken tops and other indications of old and decaying wood (decadence); numerous large snags; and heavy accumulations of wood, including large logs on the ground (coarse woody debris).

Overstory. That portion of trees which form the uppermost layer in a forest stand which consists of more than one distinct layer (canopy).

Perennial Streams. Streams that flow continuously throughout the year.

Precommercial Thinning. The practice of removing some of the trees less than merchantable size from a stand so that remaining trees will grow faster.

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.).

Prescribed Fire. A preplanned wildland fire burning under specified conditions to accomplish specific planned objectives. It could result from either a planned or unplanned ignition.

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

Regeneration. The renewal of a tree crop, whether by natural or artificial means. This term might also refer to the crop itself(seedlings, saplings).

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.

Seral Stages. The series of relatively transitory plant communities that develop during ecological succession from bare ground to the climax stage. Generally there are five stages recognized: early-seral, mid-seral, late-seral, mature-seral, and old-growth.

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.

Stand. A community of trees or other vegetation uniform in composition, physiognomy, spatial arrangement, or condition to be distinguishable from adjacent communities.

Structural Diversity. Variety in a forest stand that results form layering or tiering of the canopy and the die-back, death and ultimate decay of trees. In aquatic habitats, the presence of a variety of structural features such as logs and boulders that create a variety of habitat.

Successional Stage. A stage or recognizable condition of a plant community which occurs during its development from bare ground to some climax plant community.

Threatened Species. Any species of plant or animal which is likely to become endangered within the foreseeable future throughout all or a significant portion of its range, and which has been designated in the Federal Register as such. In addition, some states have declared certain species in their jurisdiction as threatened or endangered.

Understory. Vegetation (trees or shrubs) growing under the canopy formed by taller trees.

Water Quality. The chemical, physical and biological characteristics of water.

Watershed. Entire area that contributes water to a drainage system or stream.

Wildfire. Any wildfire not designated and managed as a prescribed fire with an approved prescription.

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

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Appendix A. Areas considered for analysis in the Five Rogues Planning Area.

Unit Number	Silviculture Prescription	Reasons to defer and comments
1S-1	Defer	Low stocking
1S-2	Fuels	
1S-3	CT	
1S-4	CT	
1S-5	Regen	
1S-6	Fuels	
1S-7	Selective	
3-1	CT	
5S-1	CT	Include 6S-3
5S-2	Regen	
5S-3	Regen	
6-1	Defer	Adjacent to Serpents Grave unit
6-2	Defer	Adjacent to Serpents Grave unit
6-4 (old unit #)	Defer	
6S-5	Regen	
6S-6	Defer	Low priority fuels
6S-7	Defer	Low priority fuels
9-1	Regen	
9-2	Regen	
13S-1	CT	VRM2 on west portion of unit. Need to review. Burgess bridge const. Currently weight restriction and cannot log on. *All section 13 units.
13S-2	CT	
13S-3	CT CT	VRM2, need to review
13S-4	CT	
15S-1	Fuels	
15S-2	CT	Identify VRM2
15S-4	Regen	
15S-5	Small diameter	
15S-6	Regen	
15S-7	Regen	

Unit Number	Silviculture Prescription	Reasons to defer and comments
18-1 (old unit #)	Defer	Limited access
23-1 (old unit #)	Defer	Limited access
23-2 (old unit #)	Defer	Limited access
23-3	Defer	
1-1	Defer	Limited access, connectivity
1-2	CT	
1-3	CT	
1-4	Defer	Consider for Fuels
1-5	Defer	Limited access
1-6	Defer	Limited access
1-7	Selective	
N2-1 (old unit #)	Defer	Limited access
N2-2 (old unit #)	Defer	Limited access
N5-1 (old unit #)	Defer	Grave Creek fuels unit
N5-2 (old unit #)	Defer	Grave Creek fuels unit
N6-1 (old unit #)	Defer	Contain King Wolf unit
N6-2 (old unit #)	Defer	Contain King Wolf unit
N6-3 (old unit #)	Defer	Contain King Wolf unit
N7-1 (old unit #)	Defer	Limited access
N7-2 (old unit #)	Defer	Limited volume
N7-3 (old unit #)	Defer	Grave Ck fuels unit
N7-4 (old unit #)	Defer	Grave Ck fuels unit
7-5	Defer	Grave Ck fuels unit
8-1		Limited access
8-2		Limited aceess
10-1	Regen	
10-2	Defer	Powerline, limited access,WA concern
10-3	Defer	Powerline, limited access, WA concern
11-1	Defer	Limited access

Unit Number	Silviculture Prescription	Reasons to defer and comments
13-1	Defer	Limited access
13-2	CT	
13-3	Regen/GS	
N13-2 (old unit #)	Defer	Powerline
N13-3 (old unit #)	Defer	Powerline
15-3	CT	
15-4	CT	
N15-7 (old unit #)	Defer	Bare ridge
N15-8 (old unit #)	Defer	Bare ridge
17-1	Regen	
17-2	Regen	
18-1	Regen/GS	
18-2	Regen/OR	
18-4	Regen	
18-5	CT	
18-6	Defer	Limited access
18-7	Regen	Include with unit 13-3
19-1	CT	Include with 18-5
19.2	Regen	Include with 18-4
19-3	CT	
N21-1 (old unit #)	Defer	Limited access
21-2	Defer	Not a fuels objective
N23-1 (old unit #)	Defer	Low 5 unit
N23-2 (old unit #)	Defer	Low 5 unit
N23-3 (old unit #)	Defer	Low 5 unit
N23-4 (old unit #)	Defer	Low 5 unit
N23-5 (old unit #)	Defer	Low 5 unit
N23-6 (old unit #)	Defer	Low 5 unit
N23-7 (old unit #)	Defer	Low 5 unit

Unit Number	Silviculture Prescription	Reasons to defer and comments
N24-1 (old unit #)	Defer	Limited access
N24-2 (old unit #)	Defer	Limited access
N24-3 (old unit #)	Defer	Limited access
N24-4 (old unit #)	Defer	Limited access
N24-5 (old unit #)	Defer	Limited access
N24-6 (old unit #)	Defer	Limited access
N24-7 (old unit #)	Defer	Limited access
N24-8 (old unit #)	Defer	Limited access
N24-9 (old unit #)	Defer	Limited access
N25-1 (old unit #)	Defer	Limited access
N25-2 (old unit #)	Defer	Limited access
N25-3 (old unit #)	Defer	Limited access
26-1	Defer	VRM2 Low 5 adjacent, limited access
26-2	Defer	Low 5 adjacent
26-3	Defer	Low 5 adjacent
N26-5 (old unit #)	Defer	Low 5 unit
N26-6 (old unit #)	Defer	Low 5 unit
27-1	CT	
27-2	CT	
27-3	CT	
27-4	CT	
29-1	Regen	
30-1		Review for Fuels
30-2	Defer	Low volume
30-3	Defer	Low volume
N31-1 (old unit #)	Defer	Low volume
31-2	Fuels	
31-3	Selective	
31-4	Selective	

Unit Number	Silviculture Prescription	Reasons to defer and comments
31-5	Fuels	
31-6	Fuels	
N31-7 (old unit #)	Defer	Adjacent to Serpents Grave
N31-8 (old unit #)	Defer	Adjacent to Serpents Grave TS
N31-9 (old unit #)	Defer	Adjacent to Serpents Grave TS
N31-11 (old unit #)	Defer	Adjacent to Serpents Grave TS
W32-1 (old unit #)	Defer	Low volume
32-1	Regen	Build road
32-2	CT	
32-3	CT	
N32-4 (old unit #)	Defer	Serpents Grave unit
N32-5 (old unit #)	Defer	Serpents Grave unit
32-6	CT	
32-7	CT	
33-1	Fuels	Slash, pile and burn
33-2	Fuels	Slash, pile and burn
N33-3 (old unit #)	Defer	Low volume
N33-4 (old unit #)	Defer	Low volume
33-5	CT	
33-8	Regen	Add to 32-1
33-10	Defer	Low volume
33-11	Fuels	
N33-12 (old unit #)	Defer	Flume Descent unit
33-13	CT	
33-14	Fuels	
N35-1 (old unit #)	Salmon Creek Interpretive Forest	
35-2	CT	
35-3	CT	
35-5	CT	
35-6	CT	
35-7	CT	

Unit Number	Silviculture Prescription	Reasons to defer and comments
35-8	CT	
35-9	Fuels	

***In this table, "deferred" means deferred from proposed action alternatives**

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

Project Name: Five Rogues Timber Sale (Hydrology/Soils**)**

6th Field HUC or Project Scale: Grave Creek-Sunny Valley

Date: 5/24/04

Preparer(s): Bob Bessey (Fish) Loren Wittenberg

Physiographic Province: Klamath/Siskiyou

Resource Area, Medford BLM Glendale Resource Area

		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;WA			X		
	Physical Barriers	WA;ODFW				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			PJ;WA		X		
Chan. Cond. & Dyna.	Width/Depth Ratio		ODFW			X		
	Streambank Condition		ODFW			X		
	Floodplain Connectivity		PJ			X		
Flow/Hydro	Peak/Base Flows		WA			X		
	Drainage Network Increase			WA		X		
Wshed Condition	Road Density and Location			WA		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.

2 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). In some cases, a "not properly functioning" indicator may be further worsened, and this should be noted.

Codes:

BLM Water temperature data
ODFW: ODFW stream habitat survey data
PJ: Professional judgment
WA: Grave Creek Watershed Analysis
EA: Five Rogues Timber Sale EA # OR118-04-_____. The Aquatic Conservation Strategy Consistency Analysis is considered a supplement to the EA
AM: Aquatic macroinvertebrate survey and report.

Project Name: Five Rogues Timber Sale (Hydrology/Soils**)**

6th Field HUC or Project Scale: Grave Creek-Placer

Date: 5/24/04

Preparer(s): Bob Bessey (Fish) Loren Wittenberg

Physiographic Province: Klamath/Siskiyou

Resource Area, Medford BLM
Glendale Resource Area

PATHWAY INDICATORS		ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)[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;WA			X		
	Physical Barriers	WA;ODFW				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			PJ;WA		X		
Chan. Cond. & Dyna.	Width/Depth Ratio		ODFW			X		
	Streambank Condition		ODFW			X		
	Floodplain Connectivity		PJ			X		
Flow/Hydro	Peak/Base Flows		WA			X		
	Drainage Network Increase			WA		X		
Wshed Condition	Road Density and Location			WA		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.

2 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). In some cases, a "not properly functioning" indicator may be further worsened, and this should be noted.

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AM: Aquatic macroinvertebrate survey and report.

Project Name: Five Rogues Timber Sale

6th Field HUC or Project Scale: Wolf Creek

Date: 5/24/04

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

Physiographic Province: Klamath/Siskiyou

Resource Area, Medford BLM
Glendale Resource Area

PATHWAY INDICATORS		ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)[2]			
		Properly Functioning[1]	**At Risk[1]**	***Not* Properly Functioning[1]**	**Restore[2]**	**Maintain[2]**	**D egrade[2]**	
Water Qual.	Temperature		WA			X		
	Sediment			AM		X		
	Chem. Contam./ Nutrient Load	PJ				X		
	Physical Barriers	WA;ODFW				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			PJ;WA		X		
Chan. Cond. & Dyna.	Width/Depth Ratio	ODFW				X		
	Streambank Condition		ODFW			X		
	Floodplain Connectivity	PJ				X		
Flow/Hydro	Peak/Base Flows		WA			X		
	Drainage Network Increase			WA		X		
Wshed Condition	Road Density and Location			WA		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.

2 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). In some cases, a "not properly functioning" indicator may be further worsened, and this should be noted.

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AM: Aquatic macroinvertebrate survey and report.

Appendix C

Five Rogues Project

SILVICULTURAL PRESCRIPTION

I. INTRODUCTION

The Five Rogues Project Area is contained within the boundaries of the Wolf Creek, Grave Creek/Sunny Valley and Grave Creek/Placer 6th field watershed boundaries. The legal description is T.33S., R.05W., Sections 5, 6, 7, 8, 17, 18, 19, 20, 29, 30, 31, 32; T.33S., R.06 W., Sections 1, 2, 3, 10, 11, 12, 13, 14, 15, 16, 21, 22, 23, 24, 25, 26, 27, 28, 29, 32, 33, 34, 35, 36; T.34S., R.05W., Sections 5, 6, 7, 8, 18, 19; T.34S., R.06 W., Sections 1, 2, 3, 4, 5, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 22, 23, and 24. The Planning Area is approximately 29,500 acres in size intermixed with public and private lands (which includes the communities of Wolf Creek and Sunny Valley). Proposed activities, however, would be limited to within the 9,600 acres of BLM managed lands.

II. RESOURCE OBJECTIVES

All of the proposed harvest units are within the matrix land allocation as described in the Northwest Forest Plan. The Medford Resource Management Plan (RMP) further separates matrix into general forest management area (GFMA) and connectivity/diversity blocks each having specific management objectives and guidelines. Visual resource management II (VRM II) objectives overlay portions of matrix within one mile of the I-5 highway corridor.

A. The overall objectives for general forest management areas and connectivity blocks (Medford RMP, p. 38, 39) are to:

- produce a sustainable supply of timber and other forest commodities,
- provide connectivity (along with other allocations such as riparian reserves) between late successional reserves,
- provide habitat for a variety of organisms associated with both late-successional and younger forests, ecological functions and maintenance of ecologically valuable structural components such as down logs, snags, and large trees.
- provide early-successional habitat.

B. The portion of the Planning Area within Visual Resource Management Class II land allocation would emphasize low levels of change to the characteristic landscape (RMP, p. 70).

III. VEGETATION MANAGEMENT STRATEGY

Tanoak, canyon live oak, madrone and chinkapin are the predominant woody species found in the understory within the Five Rogues Project Planning Area. These species are associated with different site conditions. Tanoak cover is generally found on the more productive sites; canyon live oak on the hot aspects and shallow soils; chinkapin on shallow soils or nutrient deficient sites; and madrone on a wide range of conditions.

Canyon live oak and tanoak are both tolerant to shade and can exist in the understory for a long period of time. They would respond in growth given full sunlight and are intense competitors to conifer growth following a stand-replacing regeneration harvest or high intensity wildfire event. Tanoak is the most aggressive competing species in the Planning Area and has the potential for a vegetation management problem after a high intensity disturbance. Madrone is intermediate in tolerance and can exist in the understory under a light overstory but is shaded out under a more densely stocked stand. Chinkapin is intolerant of shade.

The use of prescribed burning is the method of treatment for both correcting the existing high level of fuels and initiating a long-term maintenance strategy of treating fuel accumulations with light underburning . The absence of fire has allowed stands to become overstocked and canopies to be more closed. Past fire suppression efforts have effectively reduced or eliminated the agent of fire. Reducing the low to moderate intensive fire return intervals has also increased the presence of tanoak and canyon live oak.

Besides fire, no known natural controls exist on the sites dominated by tanoak and canyon live oak. Fire has historically been the regulator in the Douglas-fir and Tanoak plant series. Dense stands with high canopy closure prevent the invasion of grasses and shade intolerant hardwood species such as madrone and chinkapin.

IV. Harvest System

Commercial Thin (CT). This treatment applies to units #1-2, #1-3, #5S-1, #3-1, #13-2 #13S-1, #13S-2, #13S-3, #13S-4, #15-3, #15-4, #15S-2, #18-5, #19-3, #27-1, #27-2, #27-3, #27-4, #32-2, #32-3, #32-6, #32-7, #33-5, #33-13, #35-2, #35-3, #35-5, #35-6, #35-7, #35-8,

The stands selected are either young commercial aged stands or all aged stands with a predominant young commercial component. The desired future condition is a vigorous stand of "second growth" conifers exhibiting good tree growth, 80%+ canopy closure, scattered large "legacy" conifers, and a component of hardwoods, snags, and residual coarse woody debris (CWD). New snag and CWD recruitment would come from residual legacy trees and the residual conifers left after thinning. Commercial thinning within the VRM2 corridor would consider visual changes to the landscape.

The primary purpose of commercial thinning is to control existing stocking levels and increase and redistribute growth on the remaining trees to enhance stand yield and quality. Measures of forest stocking levels, such as Relative Density (Drew and Flewelling) provide a relative density value of the actual density of a stand relative to a maximum. The desired condition after harvest is approximately 35% of the maximum, or a relative density value of 0.35. Relative densities above .55 (the mortality zone) are considered to be in the zone where trees become suppressed and die because of competition (Hayes et.al.). While some stands within Five Rogues exhibit even-aged characteristics that are appropriate for relative density comparisons, most of the stands are comprised of mixed ages (multiple cohorts) that reflect previous harvesting and/or historical fire intervals. The mean interval between fires has been noted to be less than 30 years for the Douglas-fir plant series in the Klamath Province (Atzet and Martin). For these stands the residual target stand basal area after harvest is 100 - 120 sq.ft / ac.

Thinning from below removes the smaller less vigorous conifers. Leave trees should be the dominant, fast-growing conifers with healthy crowns, generally 30% or greater crown ratios. Tree condition should be considered as priority for leave over even spacing. Areas in the stand that do not have at least 100 sq ft./ac of **conifer** basal area should be left alone. The occasional old growth conifers in the stand should be retained for structural variety and are part of the leave basal area. The leave basal area chosen, 100-110 sq ft/ac, gives a good combination of long term stand growth and economically viable thinning at this time. Specific post harvest or site preparation work would be evaluated after harvest.

Selective Cut (SC). This treatment applies to units 1-7, 1S-3, 1S-4, 1S-7, 31-3, 31-4

The stands selected are generally all aged with multiple canopy layers and overstocked in small or large portions of the unit. The objective of the selection cut is to individually mark trees to modify the existing stand structure. This is intended to capture wood volume of suppressed conifers, overstocked portions of the stand to redistribute growth potential to the residual trees and in some instances, release conifer reproduction. Favorable characteristics of the existing stand structure can be retained such as high canopy retention approaching 40% canopy cover, 100-120 sq.ft. basal area/ac , snags, down logs, and hardwood components.

Trees in all diameter classes are considered crop trees. Some discrimination among the immature trees must occur, such that the least healthy are harvested during the cutting cycle operations and the most vigorous are retained. Priority leave for large conifers are the largest and most vigorous, while meeting the objectives above.

Group Selection (GS). This treatment applies to units #13-3, #18-1

Unit 13-3 is within Visual Resource Management II (VRM II) lands and unit 18-1 is within northern GFMA. The management actions/direction is to manage VRM II lands for low levels of change to the characteristic landscape. Management activities may be seen but should not attract the attention of the casual observer (ibid., p. 70).

The Desired Future Condition is an overstory of large conifers with ½ to 1 acre openings having a variety of age and size classes of conifers from seedlings to pole size with a component of hardwoods, snags, and residual course woody debris (CWD). New snag and CWD recruitment would come from residual legacy trees and the next stand of conifers would act as a replacement source for the legacy overstory trees as mortality occurs.

The group selection system is an uneven-aged silvicultural system in which small groups approximately 1 acre in size are to be are to be periodically harvested and regenerated within the boundaries of units #13-3 and #18-1. Approximately 7-10 % within the total unit boundary would be harvested at this entry. The first group harvested would be replanted, allowed to grow, and then harvested at approximately age 150. This would create a mosaic of age classes scattered across the larger unit. Harvest all of the trees within small openings of ½ to 1 acre. The reserve trees in between the openings would count towards the 7-10 conifer leave trees per acre. The objective is to create vertical structure and imitate small openings often created in un-entered mature stands when small root rot pockets occur or windthrow creates small openings.

Regeneration harvest (RH). This treatment applies to units #1S-5, #5S-2, #5S-3, #6S-5, #9-1, #9-2, #10-1, #17-1, #17-2, #15S-4, #15S-6, 15S-7, #18-2, #18-4, #18-7, #18-8, #18-9, #29-1, #32-1,

The desired future condition is a scattered overstory of large "legacy" conifers (7-10 TPA) with well-stocked understory of vigorous conifers, and component of hardwoods, snags, and residual course woody debris (CWD). New snag and CWD recruitment would come from residual legacy trees and the next stand of conifers would act as a replacement source for the legacy overstory trees as mortality occurs. The purpose of a regeneration harvest is to replace the existing mature stand with a new young even-aged stand within the guidelines of the RMP and Northwest Forest Plan.

Harvest the merchantable conifers leaving 7 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 unit rather than clumped, unless it is determined they need to be clumped for habitat retention for a wildlife species of concern. A minimum of 1/3 of the leave trees should be without obvious defect (conk, insects, etc.). Leave up to 10 conifers per acre where the soils are rocky, and small rock outcrops are present.

Units within connectivity blocks are designated by the Medford District RMP/ROD with a primary objective of maintaining late successional vegetation on a minimum of 25- 30% of each block The desired condition is a scattered overstory of large "legacy" conifers (12-18TPA) with a well-stocked understory of vigorous conifers, and component of hardwoods, snags, and residual coarse woody debris (CWD).

5-Rogues Timber Sale

STAND DESCRIPTIONS

UNITS 1-2,1-3 T.33S., R.5W., section 1

I. Stand Description: Units 1-2 and 1-3 are mature stands of Douglas-fir with occasional sugar pine. Diameters generally range from 16-36" with a few trees being larger. Stand is starting to show signs of overstocking and some mortality. There are flat-topped trees, larger snags, and openings created where trees have fallen. Other hardwoods present include Canyon Live oak, madrone, and black oak. There is very limited conifer regeneration within the stand. Some mortality is occurring. Very little conifer regeneration exists.

II. Analysis: These units are within connectivity/diversity blocks (specific management/direction to provide connectivity between late-successional reserves) and Visual Resource Management II lands. The matrix land allocation (identified in the Northwest Forest Plan) was further divided under the Medford Resource Management Plan (RMP) to include general forest management areas and connectivity/diversity blocks. While matrix lands emphasize timber harvest, connectivity blocks have a primary objective of maintaining late-successional forest on a minimum of 30% of that block and retaining 12-18 green conifer trees per acre in regeneration harvest units. Riparian reserves and other allocations with late-successional forest count toward this percentage (RMP, p. 40).

Desired Future Condition: The desired future conditions resulting from these actions would, in the short-term, be a stand with lower stand stem density. The upper canopy layer would consist of mature Douglas-fir and sugar pine. Trees within this canopy layer would provide larger structural elements such as snags and coarse woody debris.

Commercial thinning in units 1-2,1-3, and 1-7 would result in stands with greater spacing between trees and tree canopies in the future stand which would provide a stand with healthier growing conditions so the stand may reach late succession characteristic stand sooner than with natural thinning processes.

Prevention/Avoidance Strategies: Maintenance of canopy cover and density would slow/prevent the establishment and growth of competitive vegetation. Controlling competitive vegetation through maintenance of canopy cover would also not substantially add to any existing seedbank in the soil. While shrubs would not be a major competitor within the existing stand, control or lack of it could be a factor in the establishment of young conifers following a future regeneration harvest.

III. Recommended Treatment: Commercial thinning units 1-2, 1-3 is the recommended treatments. The thinning should be from below with the emphasis on maintaining a minimum canopy cover of 40%to 60% across the unit. Generally, this should correspond to an approximate 25'X 25' to 30' X 30' spacing on these units. Helicopter yard. Handpile slash. Burn piles.

Future harvesting could include removing large overstory trees in excess of the number required for regeneration harvest in matrix would be removed.

UNIT 5S-2, 5S-3 T.34 S., R.5 W., sections 5

I. Stand Description: Units 5S2,3 are ridgetop and upper slope stands. Diameters generally range from 14-24". The stands are mature and almost mature Douglas-fir generally with some sugar and ponderosa pine of the same size. The understory consists of madrone trees 16-30' tall mixed with an occasional tree form white oak and black oak. Hardwoods are dying out of the stand. Along the ridge, larger and older Douglas-fir can be found.

II. Analysis: This area is designated matrix. Conifers within the stand are of a condition where they would not meaningfully respond to release. The majority of the stand does not exhibit signs of decadence.

Desired Future Condition: The desired future condition resulting from this action would in the short-term be a single storied stand of vigorously growing windfirm conifers with occasional larger, mature and older Douglas-fir and pine. In the long-term the stand would consist of two canopy layers. The dominant canopy layer would consist of widely spaced large conifers. Species of this layer would primarily be Douglas-fir with minor amounts of sugar pine and ponderosa pine. Trees within this canopy layer would provide larger structural elements such as snags and coarse woody debris. The second canopy layer would be comprised of predominantly mature Douglas fir with some sugar and ponderosa pine. The stand would contain 3-5 larger hardwoods per acre.

Prevention/Avoidance Strategies: Controlling competitive vegetation through maintenance of canopy cover would also not substantially add to any existing seedbank in the soil. While shrubs would not be a major competitor within the existing stand, control or lack of it could be a factor in the establishment of young conifers following a future regeneration harvest.

III. Recommended Treatment: Modified even-aged regeneration harvest (RH) is recommended for unit 5S-2 and 5S-3. Harvest merchantable conifers greater than 7.5 inches dbh. Retain 7 conifers across the range of diameters over 20" dbh per acre. Retained conifers should approximate species composition of present stand and should be dispersed throughout the unit. Retained conifers should consist of both sound and cull trees. Retain one additional conifer greater than 16" dbh for future snags and coarse woody debris. Retain 3-5 large hardwoods per acre where present.

UNIT 17-1, 17-2 T.33S., R.5W., section 17

I. Stand Description: Units 17-1, 2 are stands of mature and older Douglas-fir with scattered sugar pine. Diameters generally range from 16-30". Decay is evident in many of the trees. Hardwoods consist of madrone, tanoak, and limited numbers of canyon live oak. Some advanced Douglas-fir regeneration exists.

II. Analysis: This unit is in a "connectivity block" as designated by the Medford District RMP/ROD with a primary objective of maintaining late seral vegetation on a minimum of 25- 30% of the section.

Desired Future Condition: The desired future condition resulting from this action would be a stand with two canopy layers. The overstory would be scattered large "legacy" conifers (12-18TPA) with well-stocked understory of vigorous conifers, and component of hardwoods, snags, and residual course woody debris (CWD). New snag and CWD recruitment would come from residual legacy trees and the next stand of conifers would act as a replacement source for the legacy overstory trees as mortality occurs.

In the short-term, the understory canopy layer would consist of young conifers that became established within a few years following harvest, treatment of activity fuels, and other site preparation. In the long-term, a two-storied structure would be retained. The stand would contain 3-5 large hardwoods per acre.

Prevention/Avoidance Strategies: Timely site preparation and reforestation following harvest would allow conifer seedlings the benefit of occupying the site before competitive species such as ceanothus, tanoak, and chinquapin.

III. Recommended Treatment: A modified Even-aged regeneration harvest (RH) is recommended for units 17-1 and 17-2. Harvest merchantable conifers greater than 7.5 inches dbh. Retain 12 to 16 conifers across the range of diameters over 20" dbh per acre. Retained conifers should approximate species composition of present stand and should be dispersed throughout the unit. Retained conifers should consist of both sound and cull trees. Retain one additional conifers greater than 16" dbh for future snags and coarse woody debris. Retain 3-5 large hardwoods per acre where present.

Cable yard unit 17-1. Helicopter yard unit 17-2. Slash brush and damaged conifers. Broadcast or handpile burn.

Plant unit with a mixture of 80% Douglas-fir and 20% minor species, principally rust resistant sugar pine. Conduct follow-up maintenance treatments through stand establishment. Follow-up treatments may include treatments such as handpiling and burning of piles to reduce activity fuels.

UNIT 13-3, 18-1, T.33S., R.6W., sec. 13 and 18

I. Stand Description: Units 13-3 and 18-1 are stands of mature and older Douglas-fir with scattered sugar pine. Diameters generally range from 14-28". Decay is evident in many of the trees. Hardwoods consist of madrone, tanoak, and limited numbers of canyon live oak. Some advanced Douglas-fir regeneration exists. Stands are north facing and occupy the upper to lower portions of the slope.

II. Analysis: Both of these units are within matrix lands. Unit 13-3 is also within VRM II land. The RMP states that all BLM administered lands would meet visual quality objectives (RMP, p. 70). These units are within the foreground/middleground (within one mile or to the first ridge, whichever is closer, RMP, p. 70) as VRM II along the I-5 freeway. The management actions/direction is to manage VRM II lands for low levels of change to the characteristic landscape. "Management activities may be seen but should not attract the attention of the casual observer" (ibid., p. 70).

Desired Future Condition: The desired future condition resulting from this action would, in the short-term, be a single storied stand one stand consisting of approximately one acre group select openings. These openings would effect approximately 7-10% of the stands. Some conifer regeneration could establish itself in disturbed areas. The lowest canopy layer would consist of young conifers that became established within a few years following harvest, treatment of activity fuels, and other site preparation. In the long-term, the stand would develop into a stand of two main canopy layers. At some point in the future the number of large conifers in the upper canopy layer would be reduced to six to eight trees per acre. The stand would contain 3-5 larger hardwoods per acre.

Prevention/Avoidance Strategies: Timely site preparation and reforestation following group selection harvest would allow conifer seedlings the benefit of occupying the site before competitive species such as ceanothus, tanoak, and chinquapin.

III. Recommended Treatment:
Group slection harvesting is recommended using 1 acre openings. The openings should have at least one and half site tree distance between there boundaries (150 to 170 ft.). Harvest merchantable conifers greater than six inches dbh. These group selection opening would have no retention trees. The surrounding stand next to the 1 acre openings would not be harvested at this time and would retain all its current overstory characteristics except where it borders the 1 acre openings.

Helicopter yard. Slash brush and damaged conifers. Handpile or lop and scatter. Burn piles or relay on natural decay.

Evaluate after harvest. If understocked areas exist, interplant with a mixture of 80% Douglas-fir and 20%, minor species, principally rust resistant sugar pin. Conduct follow-up maintenance treatments through stand establishment.

UNIT 18-4 T.32S., R.7W., section 23

I. Stand Description: Unit 18-4 stand of mature and older Douglas-fir with scattered Ponderosa and Sugar pine. Diameters generally range from 16-30". Decay is evident in many of the trees. Hardwoods consist of madrone, tanoak, and limited numbers of canyon live oak. Natural suppressed Douglas-fir regeneration exists. This stand occupies the mid slope area of a south facing slope and fire scars are evident on many of the old growth trees.

II. Analysis: This area is designated matrix. An owl core area is located directly northeast and upslope from this stand.

Desired Future Condition: The desired future condition resulting from this action would, in the short-term, be a stand with two canopy layers. The upper canopy layer would consist of large Douglas-fir. Trees within this canopy layer would provide larger structural elements such as snags and coarse woody debris. The understory canopy layer would consist of young conifers that became established within a few years following harvest, treatment of activity fuels, and other site preparation. In the long-term the stand would retain a two storied structure. The stand would contain 3-5 larger hardwoods per acre.

Prevention/Avoidance Strategies: Timely site preparation, reforestation, and pre commercial thinning following harvest would allow conifer seedlings to occupy the site before competitive brush species.

III. Recommended Treatment: A modified even-aged regeneration harvest (RH) is recommended. Harvest merchantable conifers greater than six inches dbh. Retain 6 to 8 conifers greater than 20” dbh per acre. These retained conifers should be from across the range of diameters over 20" dbh. Retained conifers should approximate species composition of present stand and should be dispersed throughout the unit. Retained conifers should consist of both sound and cull trees. Retain 3-5 larger hardwoods per acre where present. Future snags and coarse woody debris would come from retained trees.

Helicopter yard. Slash brush and damaged conifer regeneration. Space nonmerchantable conifers. Handpile slash and burn piles. Plant with a mixture of Douglas-fir and rust resistant sugar pine. Conduct follow-up maintenance, protection treatments such as brushing and tubing through establishment.

UNITS 18-2, 18-7, 18-8, 18-9 T.32S., R.7W., section 23

I. Stand Description: : These stands are comprised of mature and older Douglas-fir with scattered ponderosa pine and sugar pine. Diameters generally range from 16-30". Decay is evident in many of the trees. Hardwoods consist of madrone, tanoak, and limited numbers of canyon live oak. Natural suppressed Douglas-fir regeneration exists. Stand is in a state of decline as evidenced by thinning tops and presence of conk. This stand occupies the upper slope area of a north facing slope.

II. Analysis: This area is designated matrix.

Desired Future Condition: The desired future condition resulting from this action would be a stand with two canopy layers. The upper canopy layer would consist of mature Douglas-fir and sugar pine. Trees within this canopy layer would provide larger structural elements such as snags and coarse woody debris. In the short-term, the understory canopy layer would consist of young conifers that became established within a few years following harvest, treatment of activity fuels, and other site preparation. In the long-term, a two-storied structure would be retained. The stand would contain 3-5 large hardwoods per acre.

Prevention/Avoidance Strategies: Timely site preparation and reforestation following harvest would allow conifer seedlings the benefit of occupying the site before competitive species such as tanoak.

III. Recommended Treatment: An even-aged regeneration harvest (RH) is recommended. An overstory removal harvest (OR) is recommended for unit 18-8.

Harvest merchantable conifers greater than 7.5 inches dbh. Retain 7 conifers across the range of diameters over 20" dbh per acre. Retained conifers should approximate species composition of present stand and should be dispersed throughout the unit. Retained conifers should consist of both sound and cull trees. Retain one additional conifer greater than 16" dbh for future snags and coarse woody debris. Retain 3-5 large hardwoods per acre where present

Helicopter yard and limited shovel yarding down to existing road. Slash brush and damaged conifer regeneration. Space nonmerchantable conifers. Handpile slash and burn piles. Plant with a mixture of Douglas-fir and rust resistant sugar pine. Conduct follow-up maintenance, protection treatments such as brushing, precommercial thinning, and tubing throughout stand establishment.

UNIT 18-5, 19-3 T.33S., R.5W., section 18, 19

I. Stand Description: Units 18-5 and 19-3 are mature stands of Douglas-fir with occasional sugar pine. Diameters generally range from 12-28" with a few trees being larger. Existing trees are predominately mature second growth with closed canopy. Stand is starting to show signs of overstocking and some mortality. There are flat-topped trees, larger snags, and openings created where trees have fallen. Other hardwoods present include canyon live oak, madrone, and black oak. There is very limited conifer regeneration within the stand. This unit is located on a south facing slope and interfaces with private land. Road access is limited. There is also a owl core area north of unit 18-5.

II. Analysis: This area is designated matrix. There are concerns due to the close proximity of the stands with the Coyote Creek road corridor.

Desired Future Condition: The desired future conditions resulting from these actions would, in the short-term, be a stand with lower stand stem density. The upper canopy layer would consist of mature Douglas-fir and sugar pine. Trees within this canopy layer would provide larger structural elements such as snags and coarse woody debris.

The commercial thin treatments in units 18-5 and 19-3 would result in stands with greater spacing between trees and tree canopies in the future stand which would provide a stand with healthier growing conditions so the stand may reach late succession characteristic stand sooner than with natural thinning processes.

Prevention/Avoidance Strategies: Maintenance of canopy cover and density would slow/prevent the establishment and growth of competitive vegetation. Controlling competitive vegetation through maintenance of canopy cover would also not substantially add to any existing seedbank in the soil. While shrubs would not be a major competitor within the existing stand, control or lack of it could be a factor in the establishment of young conifers following a future regeneration harvest.

III. Recommended Treatment: Commercial thinning is the recommended treatment. The thinning should be from below with the emphasis on maintaining a minimum canopy cover of 40% to 60% across the unit. Generally, this should correspond to an approximate 25'X 25' to 30' X 30' spacing on these units. Helicopter yard. Handpile slash. Burn piles.

Future harvesting could include removing large overstory trees in excess of the number required for regeneration harvest in matrix.

UNIT 31-3 & 31-4 T.33S., R.5W., section 31

I. Stand Description: Units 31-3 and 31-4 are mature stands of Douglas-fir with occasional sugar pine. Diameters generally range from 12 to 36" with a few trees being larger. Stand is starting to show signs of overstocking and some mortality. There are flat-topped trees, larger snags, and openings created where trees have fallen. Other hardwoods present include big leaf maple, madrone, and black oak. There is very limited conifer regeneration within the stand. This unit is located on a southeast facing slope and interfaces with private land.

II. Analysis: This area is designated matrix. Stand meets RMP guidelines for regeneration harvest. There are concerns due to the close proximity of the stands with the Miller Gulch drainage that has received heavy logging activity. Existing trees are predominately mature second growth with closed canopy. Some mortality is occurring. Some healthy conifer regeneration exists.

Desired Future Condition: The desired future conditions resulting from these actions would, in the short-term, be a stand with lower stand stem density. The upper canopy layer would consist of mature Douglas-fir and sugar pine. Trees within this canopy layer would provide larger structural elements such as snags and coarse woody debris.

The selection cut treatment in units 31-3 and 31-4 would result in stands with greater spacing between trees and tree canopies in the future stand which would provide a stand with healthier growing conditions so the stand may reach late succession characteristic stand sooner than with natural thinning processes.

Prevention/Avoidance Strategies: Maintenance of canopy cover and understory density control would slow/prevent the establishment and growth of competitive vegetation. Brushing and microsite tree planting may be used to insure the development of a healthy conifer understory.

III. Recommended Treatment: Selection cutting s the recommended treatment. The thinning should be from all diameter classes with the emphasis on maintaining a minimum canopy cover of 50% across the unit. Generally, this should correspond to an approximate 40’ x 40’ spacing on these units. Cable yard. Handpile slash. Burn piles.

Interplanting with shade tolerant tree species may be required in the future to establish conifers in the openings created by this harvest method and subsequent slash treatments.

UNIT 32-2,32-3,32-6 & 32-7 T.33S., R.5W., section 32

I. Stand Description: Units 32-2,3, & 7 are mature stands of Douglas-fir with occasional sugar pine. Diameters generally range from 12 to 36" with a few trees being larger. Stand is starting to show signs of overstocking and some mortality. There are flat-topped trees, larger snags, and openings created where trees have fallen. Other hardwoods present include big leaf maple, madrone, and black oak. There is very limited conifer regeneration within the stand. This unit is located on a southeast facing slope and interfaces with private land.

II. Analysis: This area is designated matrix. Stand meets RMP guidelines for regeneration harvest. There are concerns due to the close proximity of the stands with the Benjamin Gulch drainage that has received heavy logging activity in the past. Existing trees are predominately mature second growth with closed canopy. Some mortality is occurring. Some healthy conifer regeneration exists.

Desired Future Condition: The desired future conditions resulting from these actions would, in the short-term, be a stand with lower stand stem density. The upper canopy layer would consist of mature Douglas-fir and sugar pine. Trees within this canopy layer would provide larger structural elements such as snags and coarse woody debris.

Prevention/Avoidance Strategies: Maintenance of canopy cover and understory density control would slow/prevent the establishment and growth of competitive vegetation.

III. Recommended Treatment: Commercial thinning is the recommended treatment. The thinning should be from all diameter classes with the emphasis on maintaining a minimum canopy cover of 40 to 60% across the unit. Generally, this should correspond to an approximate 25’ x 25’ to 35’x35’ spacing on these units. Cable yard. Handpile slash. Burn piles.

UNIT 27-1,2,3,4 T.33S., R.6W., section 27

I. Stand Description: Units 27-1,2,3,4 are even-aged stands of second growth Douglas-fir with occasional sugar pine. Diameters generally range from 12 to 36" with a few trees being larger. Stand is starting to show signs of overstocking and some mortality. Other hardwoods present include madrone, and black oak. There is very limited conifer regeneration within the stand. This unit is located on east and northeast facing slopes.

II. Analysis: This area is designated matrix. Existing trees are predominately mature second growth with closed canopy. Some mortality is occurring. Some healthy conifer regeneration exists.

Desired Future Condition: The desired future conditions resulting from these actions would, in the short-term, be a stand with lower stand stem density. The upper canopy layer would consist of mature Douglas-fir and sugar pine. Trees within this canopy layer would provide larger structural elements such as snags and coarse woody debris.

Prevention/Avoidance Strategies: Maintenance of canopy cover and understory density control would slow/prevent the establishment and growth of competitive vegetation.

III. Recommended Treatment: Commercial thinning is the recommended treatment. The thinning should be from below with the emphasis on maintaining a minimum canopy cover of 40 to 60% across the unit. Generally, this should correspond to an approximate 25’ x 25’ to 35’x35’ spacing on these units. Commercial thinning would result in stands with greater spacing between trees and tree canopies in the future stand which would provide a stand with healthier growing conditions so the stand may reach late succession characteristic stand sooner than with natural thinning processes. Cable and tractor yard. Handpile slash. Burn piles.

UNIT 32-1 T.33S., R.6W., section 32

I. Stand Description: : Unit 32-1 is a mature stand of older Douglas-fir with scattered ponderosa and sugar pine. Diameters generally range from 16-30". Decay is evident in many of the trees. Hardwoods consist of madrone, tanoak, and limited numbers of canyon live oak. Natural suppressed Douglas-fir regeneration exists. This stand occupies the lower slope area of a west facing slope. A natural meadow is located on the southern half of this 40 acre parcel.

II. Analysis: This area is designated matrix. Stand meets RMP guidelines for regeneration harvest. Stand is in a state of decline as evidenced by thinning tops and presence of conk.

Desired Future Condition: The desired future condition resulting from this action would be a stand with two canopy layers. The upper canopy layer would consist of mature Douglas-fir and sugar pine. Trees within this canopy layer would provide larger structural elements such as snags and coarse woody debris. In the short-term, the understory canopy layer would consist of young conifers that became established within a few years following harvest, treatment of activity fuels, and other site preparation. In the long-term, a two-storied structure would be retained. The stand would contain 3-5 large hardwoods per acre.

Prevention/Avoidance Strategies: Timely site preparation and reforestation following harvest would allow conifer seedlings the benefit of occupying the site before competitive species such as tanoak.

III. Recommended Treatment: An even-aged regeneration harvest (RH) is recommended for unit 32-1. Harvest merchantable conifers greater than 7.5 inches dbh. Retain 7 conifers across the range of diameters over 20" dbh per acre. Retained conifers should approximate species composition of present stand and should be dispersed throughout the unit. Retained conifers should consist of both sound and cull trees. Retain one additional conifer greater than 16" dbh for future snags and coarse woody debris. Retain 3-5 large hardwoods per acre where present

Helicopter yard and limited shovel yarding down to existing road. Slash brush and damaged conifer regeneration. Space nonmerchantable conifers. Handpile slash and burn piles. Plant with a mixture of Douglas-fir and rust resistant sugar pine. Conduct follow-up maintenance, protection treatments such as brushing, pre-commercial thinning, and tubing throughout stand establishment.

UNITS 33-5,33-13 T.33S., R.6W., section 33

I. Stand Description: Units 33-5,13 are even-aged stands of second growth Douglas-fir with occasional sugar pine. Diameters generally range from 12 to 36" with a few trees being larger. Stand is starting to show signs of overstocking and some mortality. Other hardwoods present include madrone, and black oak. There is very limited conifer regeneration within the stand. This unit is located on east and northeast facing slopes.

II. Analysis: This area is designated Matrix.

Desired Future Condition: The desired future conditions resulting from these actions would, in the short-term, be a stand with lower stand stem density. The upper canopy layer would consist of mature Douglas-fir and sugar pine. Trees within this canopy layer would provide larger structural elements such as snags and coarse woody debris.

Prevention/Avoidance Strategies: Maintenance of canopy cover and understory density control would slow/prevent the establishment and growth of competitive vegetation.

III. Recommended Treatment: Commercial thinning is the recommended treatment. The thinning should be generally from below with the emphasis on maintaining a minimum canopy cover of 40 to 60% across the unit. Generally, this should correspond to an approximate 25’ x 25’ to 35’x35’ spacing on these units. Commercial thinning would result in stands with greater spacing between trees and tree canopies in the future stand which would provide a stand with healthier growing conditions so the stand may reach late succession characteristic stand sooner than with natural thinning processes Cable and tractor yard. Handpile slash. Burn piles.

UNITS 15S-2, 35-8 T.33S., R.6W., section 35

I. Stand Description: These are even-aged stands of second growth Douglas-fir with occasional sugar pine. Stand is starting to show signs of overstocking and some mortality. Other hardwoods present include madrone, and black oak. There is very limited conifer regeneration within the stand. This unit is located on east and northeast facing slopes.

II. Analysis: Both of these units are within matrix and VRM II land. The RMP states that all BLM administered lands would meet visual quality objectives (RMP, p. 70). These units are within the foreground/middleground (within one mile or to the first ridge, whichever is closer, RMP, p. 70) as VRM II along the I-5 freeway. The management actions/direction is to manage VRM II lands for low levels of change to the characteristic landscape. "Management activities may be seen but should not attract the attention of the casual observer" (ibid., p. 70).

Desired Future Condition: The desired future conditions resulting from these actions would, in the short-term, be a stand with lower stand stem density. The upper canopy layer would consist of mature Douglas-fir and sugar pine. Trees within this canopy layer would provide larger structural elements such as snags and coarse woody debris.

Prevention/Avoidance Strategies: Maintenance of canopy cover and understory density control would slow/prevent the establishment and growth of competitive vegetation.

III. Recommended Treatment: Commercial thinning is the recommended treatment. The thinning should be from below with the emphasis on maintaining a minimum canopy cover of 40 to 60% across the unit. Generally, this should correspond to an approximate 25' x 25' to 35'x35' spacing on these units. Commercial thinning would result in stands with greater spacing between trees and tree canopies in the future stand which would provide a stand with healthier growing conditions so the stand may reach late succession characteristic stand sooner than with natural thinning processes Cable yard. Handpile slash. Burn piles.

UNITS 35-2,3,5,6,7 T.33S., R.6W., section 35

I. Stand Description: Units 35-2,3,5,6,7 are even-aged stands of second growth Douglas-fir with occasional sugar pine. Diameters generally range from 12 to 28" with a few trees being larger. Stand is starting to show signs of overstocking and some mortality. Other hardwoods present include madrone, and black oak. There is very limited conifer regeneration within the stand. This unit is located on west and southwest facing slopes.

II. Analysis: Both of these units are within matrix and VRM II land. The RMP states that all BLM administered lands would meet visual quality objectives (RMP, p. 70). These units are within the foreground/middleground (within one mile or to the first ridge, whichever is closer, RMP, p. 70) as VRM II along the I-5 freeway. The management actions/direction is to manage VRM II lands for low levels of change to the characteristic landscape. "Management activities may be seen but should not attract the attention of the casual observer" (ibid., p. 70).

Desired Future Condition: The desired future conditions resulting from these actions would, in the short-term, be a stand with lower stand stem density. The upper canopy layer would consist of mature Douglas-fir and sugar pine. Trees within this canopy layer would provide larger structural elements such as snags and coarse woody debris.

The commercial thin units 35-2,3,5,6,7, would result in stands with greater spacing between trees and tree canopies in the future stand which would provide a stand with healthier growing conditions so the stand may reach late succession characteristic stand sooner than with natural thinning processes.

Prevention/Avoidance Strategies: Maintenance of canopy cover and understory density control would slow/prevent the establishment and growth of competitive vegetation.

III. Recommended Treatment: Commercial thinning is the recommended treatment. The thinning should be from suppressed and codominant canopy classes with the emphasis on maintaining a minimum canopy cover of 40 to 60% across the unit. Generally, this should correspond to an approximate 25' x 25' to 35'x35' spacing on these units. Helicopter yard. Handpile slash. Burn piles.

UNITS 1S-3, 1S-4, 1S-7 T.34S., R.6 W., section 1

I. Stand Description: Units 1S-3,4,5 are mature stands of Douglas-fir with occasional sugar pine. Diameters generally range from 20-36" with a few trees being larger. Stand is starting to show signs of overstocking and some mortality. There are flat-topped trees, larger snags, and openings created where trees have fallen. Other hardwoods present include Canyon Live oak, madrone, and black oak. There is conifer regeneration within the stand. These stands have been entered before with a commercial thin.

II. Analysis: This area is designated matrix. There are Visual Resource Management concerns due to the close proximity of the stands with the I-5 corridor and Sunny Valley, Oregon. A portion of 1S-7 is withing VRM II. Existing trees are predominately mature second growth with closed canopy. Some mortality is occurring. Patchy conifer regeneration exists.

Desired Future Condition: The desired future conditions resulting from these actions would, in the short-term, be a stand with lower stand stem density. The upper canopy layer would consist of mature Douglas-fir and sugar pine. Trees within this canopy layer would provide larger structural elements such as snags and coarse woody debris.

Prevention/Avoidance Strategies: Maintenance of canopy cover and density would slow/prevent the establishment and growth of competitive vegetation. Controlling competitive vegetation through maintenance of canopy cover would also not substantially add to any existing seedbank in the soil. While shrubs would not be a major competitor within the existing stand, control or lack of it could be a factor in the establishment of young conifers following a future regeneration harvest.

III. Recommended Treatment: Selective cutting is the recommended treatments. The selection should be from below with the emphasis on maintaining a minimum canopy cover of 50% across the unit. 1S-7 should maintain not remove trees below 60% canopy. Generally, the trees selected for harvest would be suppressed and showing outward signs of low vigor. Cable yard. Handpile slash. Burn piles.

Future harvesting could include removing large overstory trees in excess of the number required for regeneration harvest in Matrix would be removed. The time required before the removal of these overstory trees would be dependant upon the development of understory conditions that meet current management recommendations for Survey and Manage species. Once these conditions are met by the understory and a limited overstory, harvest of retained large conifers in excess of the number called for in the RMP would occur.

UNIT 3-1 T.33S., R.6W., section 35

I. Stand Description: Unit 3-1 is an even-aged stand of second growth Douglas-fir with occasional sugar pine. Diameters generally range from 12 to 26" with a few trees being larger. Stand is starting to show signs of overstocking and some mortality. Other hardwoods present include madrone, and black oak. There is very limited conifer regeneration within the stand. This unit is located on east and northeast facing slopes.

II. Analysis: This area is designated matrix.

Desired Future Condition: The desired future conditions resulting from these actions would, in the short-term, be a stand with lower stand stem density. The upper canopy layer would consist of mature Douglas-fir and sugar pine. Trees within this canopy layer would provide larger structural elements such as snags and coarse woody debris.

Prevention/Avoidance Strategies: Maintenance of canopy cover and understory density control would slow/prevent the establishment and growth of competitive vegetation.

III. Recommended Treatment: Commercial thin units 3-1 is the recommended treatment. The thinning should be from all below with the emphasis on maintaining a minimum canopy cover of 40 to 60% across the unit. Generally, this should correspond to an approximate 25’ x 25’ to 35’x35’ spacing on these units. Commercial thinning would result in stands with greater spacing between trees and tree canopies in the future stand which would provide a stand with healthier growing conditions so the stand may reach late succession characteristic stand sooner than with natural thinning processes. Cable yard. Handpile slash. Burn piles.

UNITS 9-1, 9-2 T.34S., R.6 W., section 9

I. Stand Description: : Unit 9-1,2 are stands of mature and older Douglas-fir with scattered ponderosa and sugar pine. Diameters generally range from 16-30". Decay is evident in many of the trees. Hardwoods consist of madrone and limited numbers of canyon live oak. Natural suppressed Douglas-fir regeneration exists. This stand occupies the lower slope area of a south facing slope.

II. Analysis: This area is designated matrix. Stands meet RMP guidelines for regeneration harvest. Stands are in a state of decline as evidenced by thinning tops and presence of conk.

Desired Future Condition: The desired future condition resulting from this action would be a stand with two canopy layers. The upper canopy layer would consist of mature Douglas-fir and sugar pine. Trees within this canopy layer would provide larger structural elements such as snags and coarse woody debris. In the short-term, the understory canopy layer would consist of young conifers that became established within a few years following harvest, treatment of activity fuels, and other site preparation. In the long-term, a two-storied structure would be retained. The stand would contain 3-5 large hardwoods per acre.

Prevention/Avoidance Strategies: Timely site preparation and reforestation following harvest would allow conifer seedlings the benefit of occupying the site before competitive species such as tanoak.

III. Recommended Treatment: An Even-aged regeneration harvest (RH) is recommended. Harvest merchantable conifers greater than 7.5 inches dbh. Retain 6 to 8 conifers across the range of diameters over 16" dbh per acre. Retained conifers should approximate species composition of present stand and should be dispersed throughout the unit. Retained conifers should consist of both sound and cull trees. Retain one additional conifer greater than 16" dbh for future snags and coarse woody debris. Retain 3-5 large hardwoods per acre where present

Helicopter yard or cable yarding up to existing road. Slash brush and damaged conifer regeneration. Space nonmerchantable conifers. Handpile slash and burn piles. Plant with a mixture of Douglas-fir and rust resistant sugar pine. Conduct follow-up maintenance, protection treatments such as brushing, pre-commercial thinning, and tubing throughout stand establishment.

UNITS 13S-1,2,3,4 T.34S., R.6W., section 13

I. Stand Description: Units 13S-1,2,3,4 are even-aged stands of second growth Douglas-fir with occasional sugar pine. Diameters generally range from 12 to 26" with a few trees being larger. Stand is starting to show signs of overstocking and some mortality. Other hardwoods present include madrone and black oak. There is very limited conifer regeneration within the stand. These units are located on ridge systems that have faces with northwest and southeast slopes. Units 13S-3 and 4 have some scattered pockets of Incense Cedar and White fir.

II. Analysis: This area is designated matrix. Existing trees are predominately mature second growth with closed canopy. Some mortality is occurring. Some healthy conifer regeneration exists.

Desired Future Condition: The desired future conditions resulting from these actions would, in the short-term, be a stand with lower stand stem density. The upper canopy layer would consist of mature Douglas-fir and sugar pine. Trees within this canopy layer would provide larger structural elements such as snags and coarse woody debris.

Prevention/Avoidance Strategies: Maintenance of canopy cover and understory density control would slow/prevent the establishment and growth of competitive vegetation.

III. Recommended Treatment: Commercial thinning is the recommended treatment. The thinning should be from below with the emphasis on maintaining a minimum canopy cover of 40 to 60% across the unit. Generally, this should correspond to an approximate 25’ x 25’ to 35’x35’ spacing on these units. Commercial thinning would result in stands with greater spacing between trees and tree canopies in the future stand which would provide a stand with healthier growing conditions so the stand may reach late succession characteristic stand sooner than with natural thinning processes. Cable and helicopter yard. Handpile slash. Burn piles.

UNITS 15S-4,6,7 T.34S., R.6 W., section 15

I. Stand Description: : Unit 15S-4,6,7 stands of mature and older Douglas-fir with scattered Ponderosa and Sugar pine. Diameters generally range from 18-36". Decay is evident in many of the trees. Hardwoods consist of madrone, tanoak and canyon live oak. Natural suppressed Douglas-fir regeneration exists. These stands occupies the mid to upper portions of a west facing slope.

II. Analysis: Stand meets RMP guidelines for regeneration harvest. Stands are within Connectivity/Diversity block, which would maintain 25-30% in late successional forest

Desired Future Condition: The desired future condition resulting from this action would be a stand with two canopy layers. The upper canopy layer would consist of mature Douglas-fir and sugar pine. Trees within this canopy layer would provide larger structural elements such as snags and coarse woody debris. In the short-term, the understory canopy layer would consist of young conifers that became established within a few years following harvest, treatment of activity fuels, and other site preparation. In the long-term, a two-storied structure would be retained. The stand would contain 12-18 conifers 3-5 large hardwoods per acre.

Prevention/Avoidance Strategies: Timely site preparation and reforestation following harvest would allow conifer seedlings the benefit of occupying the site before competitive species such as tanoak.

III. Recommended Treatment: An even-aged regeneration harvest (RH) is recommended for units 15S-4,6,and 7. Harvest merchantable conifers greater than 7.5 inches dbhand retain 12-18 trees per acre across the range of diameters over 20" dbh per acre. Retained conifers should approximate species composition of present stand and should be dispersed throughout the unit. Retained conifers should consist of both sound and cull trees. Retain one additional conifer greater than 16" dbh for future snags and coarse woody debris. Retain 3-5 large hardwoods per acre where present

Helicopter yard or cable yarding up to existing road. Slash brush and damaged conifer regeneration. Space nonmerchantable conifers. Handpile slash and burn piles. Plant with a mixture of Douglas-fir and rust resistant sugar pine. Conduct follow-up maintenance, protection treatments such as brushing, pre-commercial thinning, and tubing throughout stand establishment.

UNITS 6S-5 T.34S., R.5 W., section 6

I. Stand Description: : Unit 6S-5 stands of mature and older Douglas-fir with scattered Ponderosa and Sugar pine. Diameters generally range from 18-36". Decay is evident in many of the trees. Hardwoods consist of madrone, tanoak and canyon live oak. Natural suppressed Douglas-fir regeneration exists. This stand occupies the east face of a slope.

II. Analysis: This area is designated matrix.Stand meets RMP guidelines for regeneration harvest. Stand is in a state of decline as evidenced by thinning tops and presence of conk.

Desired Future Condition: The desired future condition resulting from this action would be a stand with two canopy layers. The upper canopy layer would consist of mature Douglas-fir and sugar pine. Trees within this canopy layer would provide larger structural elements such as snags and coarse woody debris. In the short-term, the understory canopy layer would consist of young conifers that became established within a few years following harvest, treatment of activity fuels, and other site preparation. In the long-term, a two-storied structure would be retained. The stand would contain 3-5 large hardwoods per acre.

Prevention/Avoidance Strategies: Timely site preparation and reforestation following harvest would allow conifer seedlings the benefit of occupying the site before competitive species such as tanoak.

III. Recommended Treatment: An even-aged regeneration harvest (RH) is recommended for unit 6S-5. Harvest merchantable conifers greater than 7.5 inches dbh. Retain 6 to 8 conifers across the range of diameters over 20" dbh per acre. Retained conifers should approximate species composition of present stand and should be dispersed throughout the unit. Retained conifers should consist of both sound and cull trees. Retain one additional conifer greater than 16" dbh for future snags and coarse woody debris. Retain 3-5 large hardwoods per acre where present

Helicopter yard or cable yarding up to existing road. Slash brush and damaged conifer regeneration. Space nonmerchantable conifers. Handpile slash and burn piles. Plant with a mixture of Douglas-fir and rust resistant sugar pine. Conduct follow-up maintenance, protection treatments such as brushing, pre-commercial thinning, and tubing throughout stand establishment.

UNITS 5S-1 T.34S., R.5 W., section 6

I. Stand Description: Unit 5S-1 is an even-aged stand of second growth Douglas-fir with occasional sugar pine. Diameters generally range from 12 to 26" with a few trees being larger. Stand is starting to show signs of overstocking and some mortality. Other hardwoods present include madrone and black oak. There is very limited conifer regeneration within the stand. This unit is located on an east facing slopes.

II. Analysis: This area is designated Matrix.

Desired Future Condition: The desired future conditions resulting from these actions would, in the short-term, be a stand with lower stand stem density. The upper canopy layer would consist of mature Douglas-fir and sugar pine. Trees within this canopy layer would provide larger structural elements such as snags and coarse woody debris.

Prevention/Avoidance Strategies: Maintenance of canopy cover and understory density control would slow/prevent the establishment and growth of competitive vegetation.

III. Recommended Treatment: Commercial thinning unit 5S-1 is the recommended treatment. The thinning should be from below with the emphasis on maintaining a minimum canopy cover of 40 to 60% across the unit. Generally, this should correspond to an approximate 25’ x 25’ to 35’x35’ spacing on these units. Commercial thinning would result in stands with greater spacing between trees and tree canopies in the future stand which would provide a stand with healthier growing conditions so the stand may reach late succession characteristic stand sooner than with natural thinning processes. Cable yard. Handpile slash. Burn piles.

UNITS 13-2, 15-3, 15-4 T.33S., R.6 W., section 15

I. Stand Description: These are even-aged stands of second growth Douglas-fir with occasional sugar pine. Diameters generally range from 12 to 26" with a few trees being larger. Stand is starting to show signs of overstocking and some mortality. Other hardwoods present include madrone and black oak. There is very limited conifer regeneration within the stand.

II. Analysis: Both of these units are within matrix and VRM II land. The RMP states that all BLM administered lands would meet visual quality objectives (RMP, p. 70). These units are within the foreground/middleground (within one mile or to the first ridge, whichever is closer, RMP, p. 70) as VRM II along the I-5 freeway. The management actions/direction is to manage VRM II lands for low levels of change to the characteristic landscape. "Management activities may be seen but should not attract the attention of the casual observer" (ibid., p. 70).

Desired Future Condition: The desired future conditions resulting from these actions would, in the short-term, be a stand with lower stand stem density. The upper canopy layer would consist of mature Douglas-fir and sugar pine. Trees within this canopy layer would provide larger structural elements such as snags and coarse woody debris.

Prevention/Avoidance Strategies: Maintenance of canopy cover and understory density control would slow/prevent the establishment and growth of competitive vegetation.

III. Recommended Treatment: Commercial thinning is the recommended treatment. The thinning should be from below with the emphasis on maintaining a minimum canopy cover of 40 to 60% across the unit. Generally, this should correspond to an approximate 25' x 25' to 35'x35' spacing on these units. Commercial thinning would result in stands with greater spacing between trees and tree canopies in the future stand which would provide a stand with healthier growing conditions so the stand may reach late succession characteristic stand sooner than with natural thinning processes. Cable yard. Handpile slash. Burn piles.

UNITS 10-1 T.33S., R.6 W., section 10

I. Stand Description: : Unit 10-1 is a stand of mature and older Douglas-fir with scattered ponderosa and sugar pine. Diameters generally range from 18-36". Decay is evident in many of the trees. Hardwoods consist of madrone, tanoak and canyon live oak. Stand is in a state of decline as evidenced by thinning tops and presence of conk. Natural suppressed Douglas-fir regeneration exists. These stands occupies an east facing slope.

II. Analysis: This area is designated Matrix. Stand meets RMP guidelines for regeneration harvest.

Desired Future Condition: The desired future condition resulting from this action would be a stand with two canopy layers. The upper canopy layer would consist of mature Douglas-fir and sugar pine. Trees within this canopy layer would provide larger structural elements such as snags and coarse woody debris. In the short-term, the understory canopy layer would consist of young conifers that became established within a few years following harvest, treatment of activity fuels, and other site preparation. In the long-term, a two-storied structure would be retained. The stand would contain 3-5 large hardwoods per acre.

Prevention/Avoidance Strategies: Timely site preparation and reforestation following harvest would allow conifer seedlings the benefit of occupying the site before competitive species such as tanoak.

III. Recommended Treatment: An even-aged regeneration harvest (RH) is recommended for unit 10-1. Harvest merchantable conifers greater than 7.5 inches dbh. Retain 6 to 8 conifers across the range of diameters over 20" dbh per acre. Retained conifers should approximate species composition of present stand and should be dispersed throughout the unit. Retained conifers should consist of both sound and cull trees. Retain one additional conifer greater than 16" dbh for future snags and coarse woody debris. Retain 3-5 large hardwoods per acre where present

Helicopter yarding. Slash brush and damaged conifer regeneration. Space nonmerchantable conifers. Handpile slash and burn piles. Plant with a mixture of Douglas-fir and rust resistant sugar pine. Conduct follow-up maintenance, protection treatments such as brushing, pre-commercial thinning, and tubing throughout stand establishment.

UNITS 29-1 T.33S., R.6 W., section 10

I. Stand Description: Unit 29-1 stands of mature and older Douglas-fir with scattered Ponderosa and Sugar pine. Diameters generally range from 18-36". Decay is evident in many of the trees. Hardwoods consist of madrone, tanoak and canyon live oak. Natural suppressed Douglas-fir regeneration exists. These stands occupy south facing slopes.

II. Analysis: This unit is in a "connectivity block" as designated by the Medford District RMP/ROD with a primary objective of maintaining late seral vegetation on a minimum of 25- 30% of the section.

Desired Future Condition: The desired future condition resulting from this action would be a stand with two canopy layers. The upper canopy layer would consist of mature Douglas-fir and sugar pine. Trees within this canopy layer would provide larger structural elements such as snags and coarse woody debris. In the short-term, the understory canopy layer would consist of young conifers that became established within a few years following harvest, treatment of activity fuels, and other site preparation. In the long-term, a two-storied structure would be retained. The stand would contain 3-5 large hardwoods per acre.

Prevention/Avoidance Strategies: Timely site preparation and reforestation following harvest would allow conifer seedlings the benefit of occupying the site before competitive species such as tanoak.

III. Recommended Treatment: An even-aged regeneration harvest (RH) is recommended for unit 29-1. Harvest merchantable conifers greater than 7.5 inches dbh. Retain 12 to 16 conifers across the range of diameters over 20" dbh per acre. Retained conifers should approximate species composition of present stand and should be dispersed throughout the unit. Retained conifers should consist of both sound and cull trees. Retain one additional conifer greater than 20" dbh for future snags and coarse woody debris. Retain 3-5 large hardwoods per acre where present

Helicopter yarding. Slash brush and damaged conifer regeneration. Space nonmerchantable conifers. Handpile slash and burn piles. Plant with a mixture of Douglas-fir and rust resistant sugar pine. Conduct follow-up maintenance, protection treatments such as brushing, pre-commercial thinning, and tubing throughout stand establishment.

Five Rogues Project Alt. 2

DRAFT 05-24-04

N
W E
S

T33S R06W

T33S R05W

T34S R06W

T34S R05W

Wolf Creek

Sunny Valley

PIPE LINE RD

I5

1 0.5 0 1 Miles

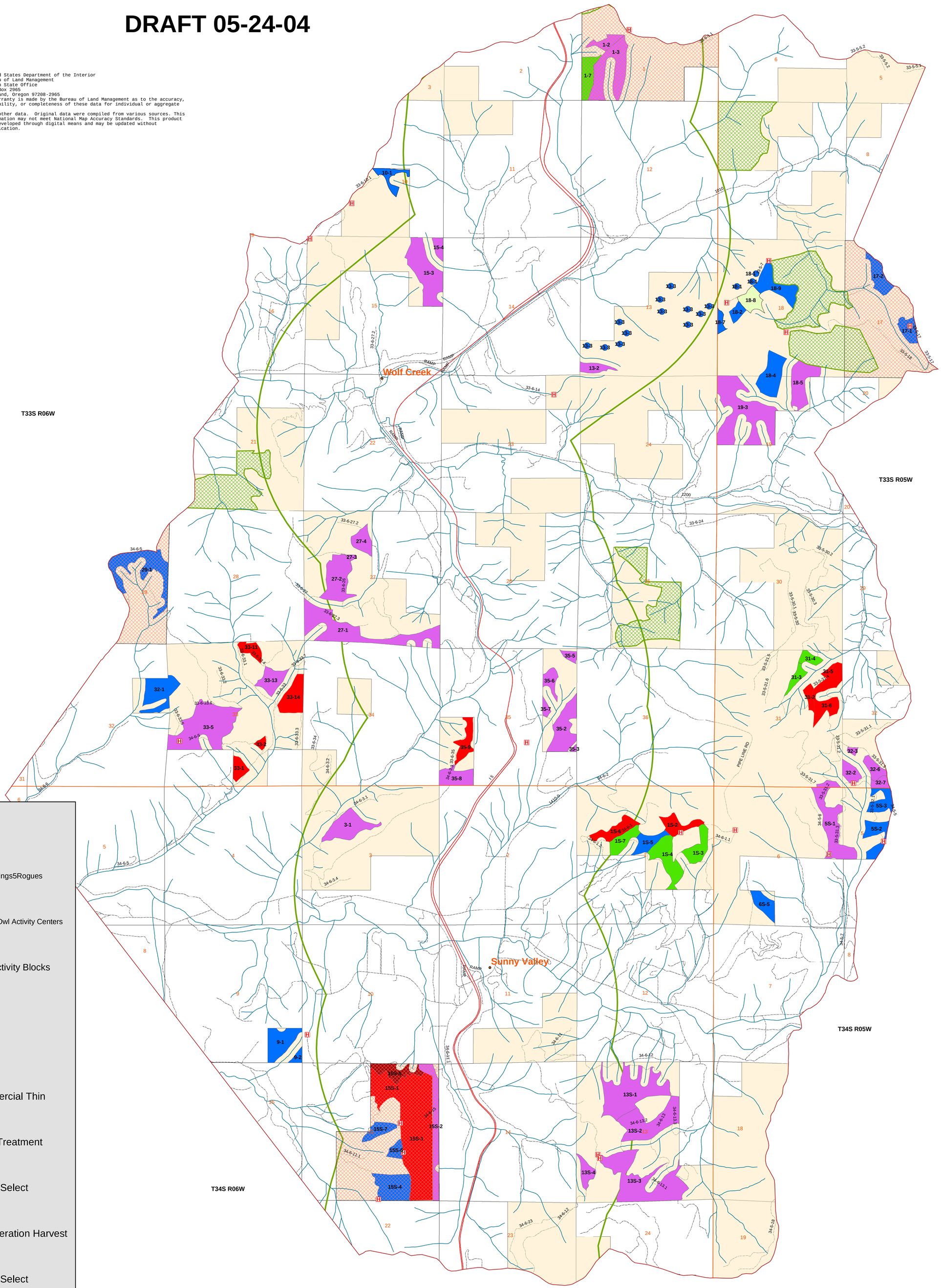
Legend

- HeliLandings5Rogues
- Spotted Owl Activity Centers
- Connectivity Blocks
- BLM
- I-5 One mile buffer
- Commercial Thin
- Fuels Treatment
- Group Select
- Regeneration Harvest
- Group Select
- Overstory Removal
- Selection Cut
- Small Diameter Harvest

Five Rogues Project Alt. 3

DRAFT 05-24-04

United States Department of the Interior
Bureau of Land Management
Oregon State Office
P.O. Box 2965
Portland, Oregon 97208-2965



Legend

- HeliLandings5Rogues
- Spotted Owl Activity Centers
- Connectivity Blocks
- BLM

Alt.3

- Commercial Thin
- Fuels Treatment
- Group Select
- Regeneration Harvest
- Group Select
- Overstory Removal
- Selection Cut
- Small Diameter Harvest
- I-5 One mile buffer

Five Rogues Project Alt. 4

DRAFT 05-24-04

N
W E
S

T33S R06W

T33S R05W

T34S R06W

T34S R05W

Wolf Creek

Sunny Valley

PIPE LINE RD

I5

1 0.5 0 1 Miles

Legend

- HeliLandings5Rogues
- Spotted Owl Activity Centers
- Connectivity Blocks
- BLM

Alt. 4

- Commercial Thin
- Ccmmercial Thin 60
- Fuels Treatment
- Group Select
- Regeneration Harvest
- Group Select
- Overstory Removal
- Selection Cut
- Small Diameter Harvest
- I-5 One mile buffer

Appendix E. Aquatic Conservation Strategy Consistency Analysis For The 5 Rogues Timber Sale.

The Northwest Forest Plan's Aquatic Conservation Strategy objectives apply only at 5th field watershed and larger scales (USDI, USBLM, 2004). The following analysis briefly describes aspects of the timber sale that are related to each of the ACS objectives and concludes whether the scope and duration of the proposed action is sufficient to preclude or achieve each objective at the 5th field watershed scale. ACS Objectives apply only to federal lands.

Forty one percent of the acreage within the project area and 48% of the Grave Creek fifth field watershed is under BLM management where land use practices must incorporate appropriate Best Management Practices (USDI 1995) and Standard and Guidelines (USDA and USDI 1994). Land use practices on private lands, which are regulated by the State of Oregon, are far less restrictive than on public lands.

Refer to Table 2-5 and 2-6 in the EA for a summary of harvest treatment acres, yarding methods, site prep and road management and to the remainder of the EA for environmental baseline and effects of the proposed action.

A. Relationship between the Proposed Action and Individual ACS Objectives

1. Maintain and restore the distribution, diversity and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.

The objective focuses on watershed and landscape scale features. These features include networks of late-successional refugia and riparian corridors that connect the terrestrial and aquatic ecosystems. A high percentage of late-successional upland and riparian forest have been impacted and fragmented by management activities. Late seral forest covers only about 39 % of the Grave Creek watershed. Distance between the remaining late seral forest has increased over the years making it less effective for wildlife use. Approximately 56% of riparian corridors on federally managed lands are in late successsional condition and is an even lower percentage on private land.

Timber harvest affects the distribution, diversity and complexity of important landscape features. Low gradient streams, ponds, wetland terraces and wet meadows, key components of aquatic ecosystems, have been adversely affected through past timber harvest, placer mining and by clearing land for homesites and agricultural use.
Relatively isolated older stands, old partial cuts and young stands in need of thinning comprise

most potential harvest units in the 5 Rogues timber sale proposal. Some harvest units would degrade diversity and complexity of terrestrial habitat in the Board Tree area, a large block of late successional vegetation. However, harvest would be consistent with the RMP ROD for Medford (p.48, UDSDI 1995) by maintaining a minimum level of 25-30% late successional habitat in each of the three connectivity blocks in the project area and at least 15% of all acres in the Grave Creek watershed in late successional condition (currently at about 39%).

Timber harvest would not retard natural succession of riparian vegetation toward late seral condition because harvest is not planned in Riparian Reserves. Non commercial vegetation and fuels treatments in selected Riparian Reserves would accelerate the development of late successional characteristics and the input of large down wood into streams. Log hauling on existing roads, road construction across streams and fuels management are the only activities that are planned in Riparian Reserves. No roads would be built parallel to and adjacent to streams, nor would there be any commercial timber harvest within riparian reserves. Appropriate BMPs and S&Gs would be applied for all activities.

Conclusion: The restorative aspects of road decommissioning, road renovation and fuels treatments would have only a minor beneficial effect at the 5th field scale in light of magnitude of the proposed action, ownership patterns and predicted future land management within the basin.

2. Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.

Riparian Reserves within the Grave Creek watershed have been negatively impacted by land management practices, such as road building, timber harvest, stream cleanout, placer mining, and land clearing for home sites and agricultural use. Only 56% of Riparian Reserve acreage is in late successional condition; the percentage for riparian habitat on private land is considerably less. Roads in Riparian Reserves have degraded and fragmented wildlife habitat. Travel corridors for wildlife have also been blocked or restricted. The combination of harvest and stream cleanout has led to an overall decrease in the diversity and complexity of riparian and instream habitat within the Grave Creek watershed. Water withdrawals and high water temperatures in mainstem Grave Creek, Wolf Creek and Coyote Creek have influenced floodplain and habitat connectivity in summer months. There are no subwatersheds within the Grave Creek HUC 5 that have not been degraded by human activity.

The proposed action avoids impacting unstable ground where floodplains, wetlands, upslope areas, headwater tributaries are known to be vulnerable to timber harvest. Retaining Riparian

Reserves will in the long term allow this habitat type on public land to recover from past human and natural disturbances and to improve their value as connectivity corridors. It is expected that although riparian habitat connectivity will improve over time on BLM land by retaining riparian reserves, it will remain highly fragmented across the watershed due to practices on interspersed private lands.

Any effects of prescribed fire within Riparian Reserves are unlikely to adversely affect connectivity in the short term and in the longterm. The action would enhance the connectivity of Riparian Reserves by creating more diverse, sustainable riparian forests.

Conclusion: The effects of the Five Rogues timber sale plan are expected to have little influence on floodplain and riparian connectivity at the fifth field scale because fuels treatment acres are minor compared to total watershed acres.

3. Maintain and restore the physical integrity of the aquatic system, including shorelines, banks and bottom configurations.

Riparian timber harvest, stream cleanout. water withdrawal and road building have adversely affected the physical integrity of aquatic systems within the Grave Creek watershed. The combination of riparian harvest and stream cleanout has led to an overall decrease in the diversity, complexity and integrity of riparian and instream habitat. Some roads have been constructed immediately adjacent to and parallel to streams, decreasing streambank stability and meander and removing future sources of large down wood. Some streambanks on BLM and private lands are unstable because of historic tractor logging and placer mining.

Rocking roads and restoring proper drainage by selective blading, replacing aging culverts and installing additional structures would help reduce the amount of fine sediment in channel substrate. The short term increases of fine sediment during road renovation, decommissioning and new construction are not expected to substantially alter channel substrate because appropriate PDFs would be used to minimize impacts. Decommissioning roads in Riparian Reserves would also help to reduce longterm erosion problems and the risk of further riparian and stream channel degradation due to road failures.

Conclusion: The physical integrity of streambanks and streambeds would be maintained at the fifth field watershed scale because effects of road renovation and decommissioning and timber harvest at the project scale would be immeasurable.

4. Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.

Water temperature and turbidity (suspended sediment) have been impacted by forest management activities, agriculture, water withdrawals and occasionally by placer mining. The State of Oregon has identified Grave Creek and eight of its tributaries as water quality limited for temperature. However, some of the problem may be the result of natural conditions (refer to the WA). Roads are important contributors of sediment to streams throughout the watershed.

Retaining Riparian Reserves at least one site potential tree height wide would help maintain and improve water temperature over the longterm and to filter sediment from overland flow that may be mobilized in harvest units and from roads. Fuels treatments in Riparian Reserves would not affect water temperature because of a minimum 25 foot no-treatment buffer. Although burning for fuels management would expose mineral soil, designing each Riparian Reserve and burn plan on a site specific basis would help ensure that they are effective at capturing any soil that may be mobilized during storm events.

Log landings would be located and designed to limit the potential for oil, fuel or other contaminants to reach streams.

Road renovation and construction would result in localized stream turbidity during the first major rainstorm of the wet season. However, it would be a negligible, short-term effect and would not impede recovery of the streams' historic sediment regimes because appropriate PDFs would be used to minimize impacts. Renovation would reduce potential for failure of the road prism and the amount of sediment that would degrade aquatic habitat. Closing roads using gates or barricades would eliminate vehicle use and erosion of unsurfaced roads during winter.

Restricting log hauling and road renovation, maintenance and decommissioning to the dry season would minimize the amount of sediment that could reach streams. Any sediment that is generated from these activities would be local and transitory, dispersing during the first several months of the wet season.

Conclusion: PDFs that are used at the project scale to restore water quality would help to maintain water quality at the fifth field watershed scale.

5. **Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate and character of sediment input, storage and transport.**

Increased sediment in streambed substrate adversely affects many aquatic species, from aquatic insects to amphibians, salmon and steelhead trout. Roads are the major contributor of sediment to streams in this watershed. There are about 800 miles of roads in this 104,371 acre watershed (about 5 miles per square mile).

All potential harvest units were inspected for indications of current and potential slope instability; problem areas were deleted from further consideration or buffered where appropriate to help ensure that harvest would not retard attainment of this objective.

Use of appropriate PDFs for blocking, decommissioning and renovating roads and for tractor logging would help to restore the natural sediment regime. Any adverse effects would be minimal, short term, localized and undetectable at the 5th field watershed scale.

Retaining Riparian Reserves that have adequate ground cover (including duff, litter and shrubs) would help ensure that any sediment that is mobilized in harvest units, from roads or in prescribed burn areas would be prevented from reaching streams and thus not exacerbate existing sediment conditions.

Treatments for forest health and fuels reduction would reduce potential for stand replacement fires that can contribute large quantities of sediment to streams and help to restore the natural sediment regime. Guidelines for prescribed burning would help minimize potential for sediment entering streams. Conversely, large stand replacement fires followed by high intensity storms, landslides and debris flows are important for maintaining aquatic habitat diversity and fish production.

Conclusion: Residual effects of the proposed action, both short term negative and long term beneficial of road construction, renovation and decommissioning, would be of insufficient magnitude to be measurable at the fifth field.

6. Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The

timing, magnitude, duration, and spatial distribution of peak, high and low flows must be protected.

Management activity can affect flow characteristics of forested watersheds through factors such as the type of timber harvest (e.g. regeneration harvest, commercial thinning), method of harvest (tractor, helicopter), area harvested (acres) in individual watersheds, road density (miles per square mile), road design (inslope, outslope), road location (valley bottom, mid-slope, ridgetop), amount of compacted ground (roads, landings), amount of a watershed in transient snow zone, amount of open canopy in transient snow zone, storm duration and intensity, in addition to many other factors. Water diversion for agricultural use (ranches and hobby farms) have seriously depleted summer streamflow in portions of the watershed; summer flow is now probably outside the range of natural variation. Road density within the watershed may have altered timing and frequency of 5 to 10 year flood events, but is unlikely to have affected peak size or timing of 25 to 100 year events (WA, page 22).

Refer to the EA discussion of the effect of timber harvest on peak and base flows (Section 4.8).

Conclusion: The proposed action would maintain the timing, magnitude, duration and spatial distribution of peak, high, and low flows at the watershed scale because effects at the project scale would be immeasurable.

7. Maintain and restore the timing, variability and duration of floodplain inundation and water table elevation in meadows and wetlands.

Background information for Objective #6 also applies to this objective.

There are no meadows or wetlands adjacent to harvest units. Virtually all streams adjacent to harvest units are hillslope or terrace- constrained so their floodplains are generally restricted to within several feet of adjacent streambanks. The proposed action would not alter streamflow or groundwater movement to any meadow or wetland within the project area on public or private lands. Seeps and springs would be protected with a 100 foot wide Riparian Reserve and all streams with a riparian reserve at least 150 feet wide each side of the stream to prevent physical disturbance of riparian habitat and to ameliorate any hydrologic changes that may result from timber harvest. Refer to the Effects section for a thorough discussion of the effects of the propsed action on streamflow.

Conclusion: The objective would be met at the watershed scale because none of the harvest units are adjacent to meadows or wetlands. Plus, any immeasurable increases in peak flow at the project scale would also be immeasurable at the watershed scale.

8. Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.

This objective focuses on riparian plant communities and the functions that they provide. Plant species composition and structural diversity, including microclimate in riparian areas and wetlands, have been adversely affected throughout the watershed by land management practices such as road building, timber harvest, stream cleanout, placer mining, and land clearing for home sites and agricultural use. Only 56% of Riparian Reserve acreage in this 5th field watershed is in late successional condition; the percentage for riparian habitat on private land is considerably less.

Retaining riparian reserves between all harvest units and adjacent streams will protect existing riparian values and provide for eventual recovery of degraded habitats over time. No commercial timber harvest is planned in riparian reserves. However, several decades of fire suppression has created situations where active management of Riparian Reserves is needed in order to meet this objective. Prescribed burning would be used in some riparian reserves to enhance species diversity and species composition, to reduce fuel loading and the potential for stand replacement fires and ultimately, to improve the longterm functioning of riparian reserves as connectivity corridors for riparian-dependent species.

Conclusion: The objective would be met at the 5th field watershed scale because the species

composition and structural diversity of plant communities would be maintained and restored in riparian areas by retaining riparian reserves.

9. Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.

Much of the discussion in Objective #8 also applies to this objective. Riparian areas provide habitat for breeding, rearing, foraging, dispersal and microclimate for many species.

Retaining riparian reserves between all harvest units and adjacent streams will protect existing values and provide for eventual recovery of degraded habitats over time through natural succession. No commercial timber harvest is planned in riparian reserves.

Any permanent roads that are constructed would cross as close to a right angle as possible in order to minimize disturbance to riparian habitat. Road decommissioning would restore riparian habitat and connectivity.

Direct losses of species that utilize riparian reserves will be minimal due to the way in which prescribed fire would be applied in fuels treatment units and because of the limited number of acres of riparian reserves that would be treated. The total impact to all wildlife species is not known; however, research suggests that direct mortality can be minimal depending on how prescribed fire is applied on the ground. Ground dwelling species may experience a loss of habitat in the short term. Since ground vegetation would be burned in a patchy manner, there would always be areas of refugia within riparian reserves.

Conclusion: This objective would be met at the fifth field watershed scale of analysis because there is no commercial harvest in any riparian reserve and local effects (positive and negative) of road and fuel treatments in riparian reserves would not be of a magnitude that would measurably alter current conditions at the 5th field watershed scale in the short or long term.

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B. Analysis of specific Medford District ROD Standards and Guidelines that apply to this project

This project is located on lands classified as Matrix (General Forest Management Area);

therefore the S&Gs (USDA and USDI 1994) for this Land Use Allocation would apply. The following S&Gs, which are required by the Medford District ROD (USDA and USDI 1994 and USDI 1995) particularly apply to this action.

1). Riparian Reserves are specified for five categories of streams or waterbodies (USDA and USDI 1994, C-30). Riparian Widths were established based on the height of an average site potential tree .

2). S&G- TM1c (C-32) states that any silvicultural practices that are applied in riparian reserves should be to control stocking, reestablish and manage stands, and acquire desired vegetation characteristics for this unique habitat type. Guidelines for slashing and burning fuels in riparian reserves are discussed in Section 2.2.1of the EA.

3). S&G RF-2a through 2g (C-32) recommends specific practices for road construction and maintenance that should be used whenever they are appropriate. All would be applied under the proposed action (EA page 2.2.10, USDI 1994). No landings are proposed in Riparian Reserves.

4) S&G RF-2b (C-32) states that a watershed analysis needs to be completed prior to constructing any new roads in riparian reserves. A watershed analysis for the Grave Creek was completed in 1999.

5) S&G RF-3a (C-32) states that road renovation and reconstruction used be used to correct situations where roads and associated drainage features pose a substantial risk to aquatic and riparian habitats. 61 miles of renovation and 0.6 miles of reconstruction are planned (EA, Table 2-6).

6) S&G RF-3c (C-33) states that whenever appropriate (considering short-term and long-term transportation needs), roads should be closed or obliterated and stabilized in order to restore or maintain the natural aquatic sediment. 0.85 miles of road would be decommissioned and as many as 3 miles of road would be barricaded or blocked (EA, Table 2-6).

7) S&G RF-4 (C-33) states that new and existing stream crossings should be able to accommodate at least the 100-year flood, including associated bedload and debris. Projects should be prioritized based on potential impact to aquatic and riparian resources. Crossings should be designed and maintained to prevent diversion of streamflow out of the channel and down the road during storm events. This would be implemented during road renovation and improvement activities (EA, Section 2.2.10).

8) S&G RF-5 (C-33) states that roads should be designed and maintained to minimize sediment delivery to streams by whatever site specific techniques may be appropriate. This would be accomplished by using appropriate PDFs (EA, Section 2.2.10) and BMPs (USDI 1995) during road renovation and construction.

9) S&G RF-6 (C-33) calls for maintaining or improving fish passage at all road crossings on fish-bearing streams. The proposed action includes replacing a rusted and undersize culvert on mainstem Flume Gulch to protect the road during peak flows and also to restore passage for cutthroat trout. Appropriate PDFs would be used for culvert replacement (EA Section 2.2.10).

10) S&G RF-7 (C-33) states that a Road Management Plan that will meet ACS objectives for the watershed should be developed and implemented. The plan is in progress.

11) S&G FM-1 (C-35) calls for designing fuel treatment practices and activities to minimize disturbance of riparian ground cover and vegetation. PDFs for proposed fuels treatments are discussed in Section 2.2.1of the EA.

Conclusion: Based on this analysis, the proposed project is consistent with the Grave Creek Watershed Analysis recommendations and findings that are related to aquatic and riparian management and applicable Standards and Guidelines of the Medford District Land Management Plan Record of Decision. The project would not hinder or prevent attainment of Aquatic Conservation Strategy objectives at the 5th field watershed scale over the long term

Literature Cited

USDA and USDI. 1994. Record Of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl. Standards and Guidelines for Management of Habitat for Late-Successional and Old Growth Related Species Within the Range of the Northern Spotted Owl.

USDI. 1995. Record Of Decision and Resource Management Plan. US Bureau of Land Management, Medford District, Medford, Oregon. Appendix D. Best Management Practices

USDA and USDI. 2004. Record of Decision. Amending Resource Management Plans for Seven Resource Management Districts and Land Resource Management Plans for Nineteen National Forests Within the Range of the Northern Spotted Owl. Decision to clarify provisions relating to the Aquatic Conservation Strategy.