United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Glendale Resource Area
2164 N.E. Spalding
Grants Pass, Oregon 97526

IN REPLY REFER TO:
1792 (ORM080)
DOI-BLM-OR-M080-2010-003-EA

APR 12 2011

Dear Interested Party:

The Fire Resiliency Project Environmental Assessment (DOI-BLM-OR-M080-2010-003-EA) prepared by the Glendale Resource Area, Medford District, Bureau of Land Management is available for public review.

This EA discloses the predicted environmental effects of the No Action Alternative and the Proposed Action (Alternative 2). Alternatives 2 includes approximately 468 acres of understory thinning, 432 acres of density management thinning, Riparian Reserve thinning, biomass removal, treatment of activity slash, 17 miles of road maintenance, and 2.2 miles temporary route reconstruction/construction. Activity slash would be handpiled and burned, or lopped and scattered to reduce fire hazard.

The Fire Resiliency Project is located within the Lawson and Rattlesnake drainages within the Glendale Resource Area of the Medford District Bureau of Land Management. The Lawson Creek area is located approximately five miles northeast of the town of Glendale, Oregon in Township 32 South, Range 6 West Sections 1, 11. The Rattlesnake Creek area is located three miles southwest of Glendale in Township 33 South, Range 6 West, Sections 6, 7; and Township 33 South, Range 7 West, Sections 1, 11.

The EA is available for review and comment starting April 8, 2011 in the Grants Pass Interagency Office, 2164 NE Spalding Avenue, 97526. Office hours are Monday through Friday, 8:00 A.M. to 4:30 P.M., closed on holidays. The document may also be accessed on the Medford District's internet site at http://www.blm.gov/or/districts/medford/plans/index.php. If you do not have internet access, or would prefer a paper copy or CD of this document, please contact Martin Lew, Environmental Planner, at (541) 471-6504.

Written comments concerning the significance, as defined in 40 CFR 1508.27, of the environmental effects predicted for this action are requested to be submitted in writing to Glendale Resource Area Field Manager, and received on or before May 9, 2011 at the address previously stated. Comments received will be considered in making the final decision.

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 by the

extent allowed by law. All submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, will be made available for public inspection on their entirety.

Thank you for your interest in public land management in the Glendale Resource Area.

Sincerely,

Katrina L. Symons
Field Manager
Glendale Resource Area

Fire Resiliency Project Environmental Assessment

DOI-BLM-OR-M080-2010-003-EA
April 2011

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
MEDFORD DISTRICT

Responsible Official: Katrina Symons
Glendale Field Manager
2164 N.E. Spalding Avenue
Grants Pass, Oregon 97526

Abstract:

The Glendale Field Manager is proposing forest management treatments analyzed under the Fire Resiliency Project Environmental Assessment. As a result of the absence of fire and past management practices, forested lands within the Glendale Resource Area currently have higher fuel loadings and more fire-prone vegetative conditions then existed historically. The Proposal includes approximately 468 acres of understory thinning, 432 acres of density management thinning, thinning in Riparian Reserves, biomass removal, treatment of activity slash, 17 miles of road maintenance, and 2.2 miles temporary route reconstruction/construction. Activity slash would be handpiled and burned, or lopped and scattered to reduce fire hazard.

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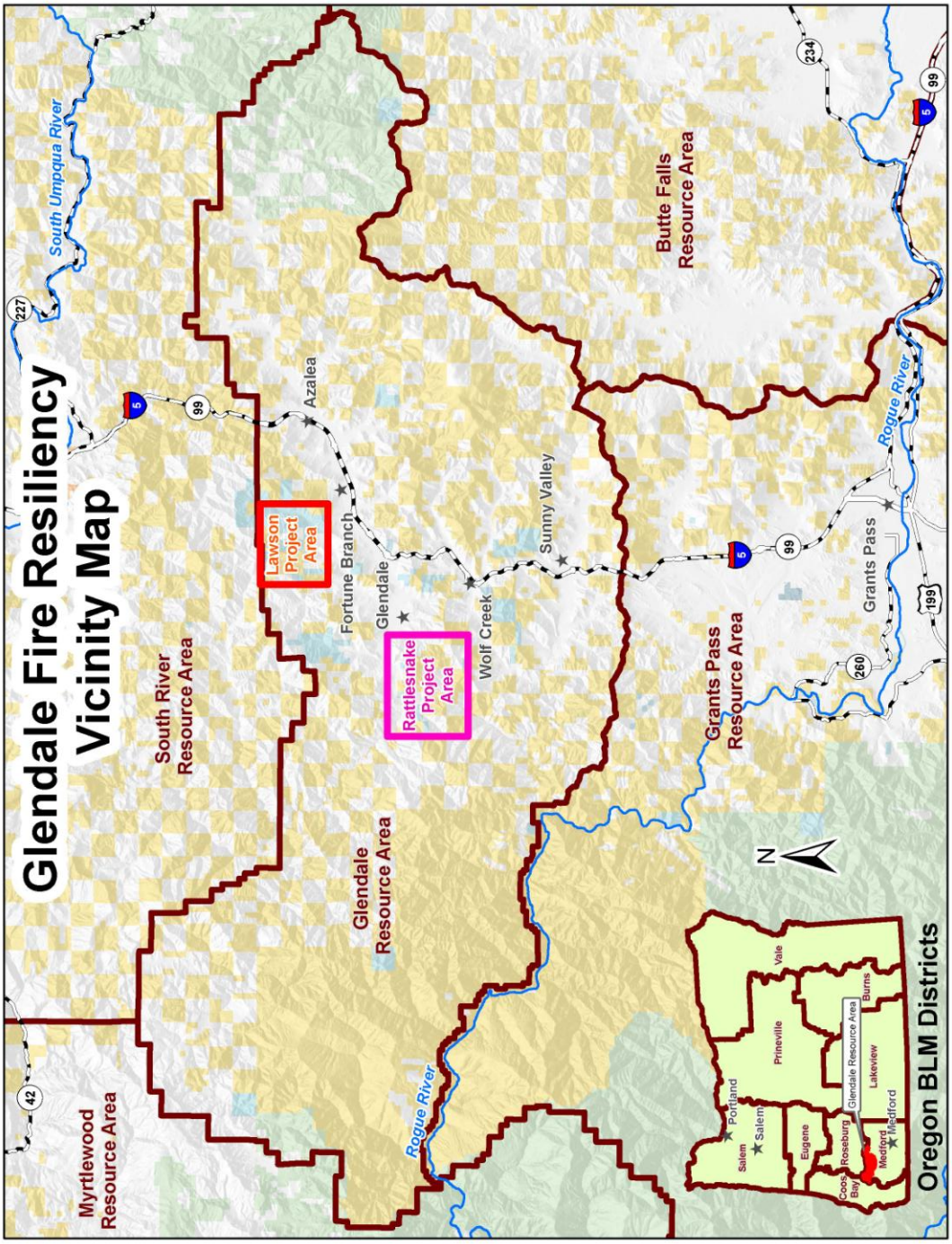
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1.0 Chapter 1 Purpose and Need

1.1 Introduction

The Fire Resiliency Project EA analyzes the predicted impacts of proposed forest management activities on the human environment in the Fire Resiliency Project Planning Area. The public was asked to comment on an initial proposal. The original BLM Proposal was to treat up to 10,000 acres Resource Area wide. The BLM has modified their Proposal to analyze approximately 900 acres in two separate areas within the Cow Creek watershed.

Chapter 1 discloses to the reader:

- What the BLM proposes to do (Proposed Action).
- Location and description of the Planning Area.
- Why the BLM is proposing these forest management activities (Purpose and Need).
- What factors the decision maker will use for choosing the alternative (Chapter 2) that will best meet the purpose and need for this proposal.
- The method for developing alternatives.
- What the decision maker will decide upon.

The analysis utilizes field data, ground verification by resource specialists and Geographical Information System (GIS) technology to estimate acres, road miles and produce reference maps. Estimates are intended to aid the reader in understanding the the Proposed Action. The reader should be aware that electronic technology can produce information that appears precise but is still dependent on further field work. During implementation, unit boundaries are posted and surveyed and unforeseen features, such as water sources, are appropriately buffered. It has been the experience for past Glendale Resource Area environmental assessments that estimates of treatment acres in the EA have been generally more than the actual acres treated on the ground.

1.2 Project Location

The Planning Area is within the Lawson and Rattlesnake drainages within the Glendale Resource Area of the Medford District Bureau of Land Management. The Lawson Creek area is located approximately five miles northeast of the town of Glendale, Oregon in Township 32 South, Range 6 West Sections 1, 11. The Rattlesnake Creek area is located three miles southwest of Glendale in Township 33 South, Range 6 West, Sections 6, 7; and Township 33 South, Range 7 West, Sections 1, 11.

1.3 Proposed Action

The Proposed Action includes approximately 468 acres of understory thinning, 432 acres of density management thinning, Riparian Reserve thinning, biomass removal, activity slash treatments, 17 miles of road maintenance, and 2.2 miles temporary route reconstruction/construction.

Low intensity underburns may occur within 7 years of initial project implementation to reduce fuel loading, ladder fuels and reduce sprouting hardwoods and /or other brush vegetation.

1.4 Purpose and Need of the Proposal

The Fire Resiliency Project is intended to meet the Medford RMP forest health objective of reducing tree mortality and restore the vigor, resiliency, and stability of forest stands that are necessary to meet land use allocations objectives (RMP, p. 62). As a result of the absence of fire and past management practices, forested lands within the Glendale Resource Area currently have higher fuel loadings and more fire-prone vegetative conditions then existed historically. This has increased the potential for high intensity, high severity wildfire events. The Fire Resiliency Project identifies the need to 1) improve forest health by creating fire resilient forests; 2) provide economic benefits; 3) reduce the fire hazard within the Planning Area protecting values at risk of loss from wildfire.

Project Objectives

The Fire Resiliency Project is designed to meet the need to improve forest health by:

- Reducing both natural and activity based fuel hazards through methods such as prescribed burning, mechanical or manual manipulation of forest vegetation and debris, removal of forest vegetation and debris, and combinations of these methods (RMP, p. 91).
- Creating fire resilient forests that have a higher probability of withstanding wildfire events so that fish and wildlife habitat as well as protecting riparian areas and water quality are maintained on the landscape
- Restore, maintain, and enhance fire-adapted ecosystems by promoting fire resiliency through forest management activities.
- Initiating a future larger strategic landscape scale planning process for the Glendale Resource Area.
- Demonstrating fire resilient forest effects through forest management practices on the Lawson and Rattlesnake areas.
-

The Fire Resiliency Project would meet the need of providing social and economic benefits:

- Creation of employment opportunities associated with service contract work, supplying commercial wood by-product material to local markets through maximizing federal funding by leveraging the goods-for-services potential of stewardship contracts.

- Social benefits include providing networking opportunities with local residents and other interested parties to design well-rounded fire resiliency projects in a collaborative manner. Provide for economic benefits including the creation of employment opportunities associated with service contract work, supplying commercial by-product material to local markets, and by maximizing federal funding by leveraging the goods-for-services potential of stewardship contracts.

The Fire Resiliency Project would reduce the fire hazard to values at risk by:

- Creating strategic areas for fire suppression activities to enhance safety.
- Reducing fire intensity and fire behavior by altering crown bulk density and crown base height.

1.5 Decision Factors

The following decision factors will be weighed, along with environmental effects of each alternative. The Field Manager will consider the extent to which each alternative would:

- Provide for reduced fire behavior, restore, maintain, and enhance fire adapted ecosystems, and promote fire resiliency
- Provide for strategic placement (ridgeline, ingress and egress) for fire suppression activities to protect public and firefighter safety? Roadways and major travel routes, because they provide access for fire suppression equipment as well as evacuation routes for the general public.
- Provide for social and economic benefits to local communities

1.6 Conformance with Land Use Plans and Other Documents

The actions proposed and analyzed in this EA were developed to be consistent with the management objectives for public lands identified in the following documents:

The proposed action is in conformance with the following plans and decisions:

- *Final Supplemental Environmental Impact Statement and Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (Northwest Forest Plan FSEIS 1994 and ROD 1994);
- *Final-Medford District Proposed Resource Management Plan/Environmental Impact Statement* and *Record of Decision* (EIS 1994 and RMP/ROD 1995);
- *Final Supplemental Environmental Impact Statement: Management of Port-Orford-Cedar in Southwest Oregon* (FSEIS 2004 and ROD 2004);
- *Final SEIS for Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (2000), and the *Record of Decision and Standards and Guidelines for Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (2001); and
- *Medford District Integrated Weed Management Plan Environmental Assessment (1998*) and tiered to the *Northwest Area Noxious Weed Control Program* (EIS 1985).

1.7 Permits and Approvals Required

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

- License agreements and/or other authorization with adjacent landowners to have a third party haul timber and use of landings.

- Compliance with the Oregon Smoke Management Plan, prescribed burning activities on the Medford District require pre-burn registration of all prescribed burn locations with the Oregon State Forester.

1.8 Scoping and Alternative Use of Resources

1.8.1 Public Scoping

The initial Fire Resiliency proposal was made available to about residents within the Wolf Creek, Sunny Valley, Glendale, and Azalea communities through the Big News newsletter and also by letters to over 2100 residents, federal, state, and county agencies, tribal and private organizations, and individuals parties. The Glendale Resource Area held three public meetings at local community buildings in Wolf Creek and Glendale. Two field trips were done in conjunction with these meetings to demonstrate site specific management practices similar to what is being proposed for the Fire Resiliency Project.

1.8.2 Alternative Use of Resources

A variety of issues and concerns were raised during project scoping by interested individuals and groups outside the BLM. In some cases, an issue was initially considered by the planning team and then eliminated from further analysis because it was not within the scope of the project or was determined to be irrelevant to making a decision on the project.

Conflicts with the Proposed Action were considered and identified in Appendix 1 and were analyzed to determine if an alternative action would be developed. Appendix 1 also explains why some alternatives were considered but not analyzed in detail and eliminated from further study.

1.9 Decisions to be Made

The Glendale Field Manager is the official responsible for deciding whether or not to prepare an Environmental Impact Statement (EIS), and whether to approve the treatments as proposed, not at all, or to some other extent.

Chapter 2.0 Alternative Ways of Accomplishing the Objectives

2.1 Introduction

This chapter presents alternative ways of meeting the project objectives identified in Chapter 1, by describing and comparing Alternative 1 (No Action Alternative) and Alternative 2 (Proposed Action) as specified in 40 CFR (Code of Federal Regulations) § 1502.14. Descriptions summarize potential environmental consequences and focus on potential actions and outputs. Best Management Practices (BMPs) and Project Design Features were identified and are included in this Chapter here to ensure project compliance with the federal Clean Water Act and higher-level National Environmental Policy Act (NEPA) documents, laws and BLM guidelines.

2.2 Description of the Alternatives

2.2.1 Alternative 1 (No Action)

The No Action Alternative provides a baseline for the comparison of the Proposed Action and describes the existing condition and the continuing trends within the Planning Area. Under the 1995 RMP, the majority of silvicultural activities are scheduled to occur within the matrix allocation. This alternative would not meet the purpose and need of the project described in Chapter 1.

Future vegetation treatments would not be precluded and could be analyzed under a subsequent EA. Stewardship project development would not occur at this time, nor would the associated employment opportunities for local communities or the opportunity to fund and implement restoration and maintenance projects.

Under the No Action Alternative, the present environmental conditions and trends will continue. The effects of other present and reasonably foreseeable future actions that are not dependent on any of the action alternatives are included in the effects analysis for this alternative.

2.2.2 Alternative 2 (Proposed Action)

Alternative 2 would treat approximately 900 acres through a combination of thinning prescriptions on Matrix and Riparian Reserve land allocations. Associated activities include fuels treatments, biomass removal, and temporary route Construction or reconstruction, and road maintenance. The timeframe of this project would be a maximum of seven years.

Understory Thinning
Alternative 2 would treat 468 acres by the use of understory thinning Understory thinning treatments would reduce the amount of ladder fuels that could carry fire from the forest floor into the crowns of the trees. Understory thinning would occur across Matrix lands as well as associated Riparian Reserves. Thinning of understory vegetation (brush and small trees) would

generally be limited to material less than eight inches diameter at breast height (dbh). Vegetation up to twelve inches dbh would be cut in two units (1-3R and parts of 1-1L).

In an effort to reduce hardwood stump sprouting, selected dominant hardwood stems would be retained. Conifer trees would be included in the spacing prescription. The spacing between conifer trees would range between 14 and 20 feet. This range of spacing would allow incorporation of existing stand characteristics (e.g. tree size, distribution, species present) into the treatment design so that land use allocation objectives in addition to fuels management objectives could be met. A 25 feet No Treatment Zone would be applied from the stream bankfull width (by slope distance) along streams, and perennial springs and seeps to protect water quality stream channel structure and water quality.

Density Management Thinning

Alternative 2 includes approximately 432 acres of density management thinning. Density management thinning of commercial sized trees on Matrix lands would reduce the probability of fire spreading from the crown of one tree to the next. To achieve this objective, density management thinning would focus on trees greater than eight inches DBH. Larger trees would generally be those selected for retention, as they tend to be more fire resilient due to their thicker bark and higher crowns.

Density management thinning would maintain and promote vigor of the remaining trees. Growth rates would be maintained or would increase on retained trees. To reduce stump sprouting, selected dominant hardwood stems would be retained. Understory thinning treatments that reduced ladder fuels and fuel loading would be done in conjunction with density management thinning in most of the treatment units.

Density management thinning would be designed to meet the objectives of reducing the fire hazard while maintaining fish and wildlife habitat by retaining a minimum:

- 60% canopy cover or greater in nesting, roosting, and foraging habitat (NRF) of Northern Spotted Owl habitat.
- 40% canopy cover or greater in dispersal Spotted Owl habitat.
- 50% canopy cover or greater in Riparian Reserves (RR).

Canopy Visual Representations – Current conditions and Post-treatment

Figure 1. Photograph at left depicts a representative existing canopy cover of approximately 95% for stands containing spotted owl nesting, roosting, and foraging habitat, in this Planning Area. The photograph at right depicts a representative post treatment at approximately 60% canopy cover to maintain nesting, roosting, and foraging spotted owl habitat.

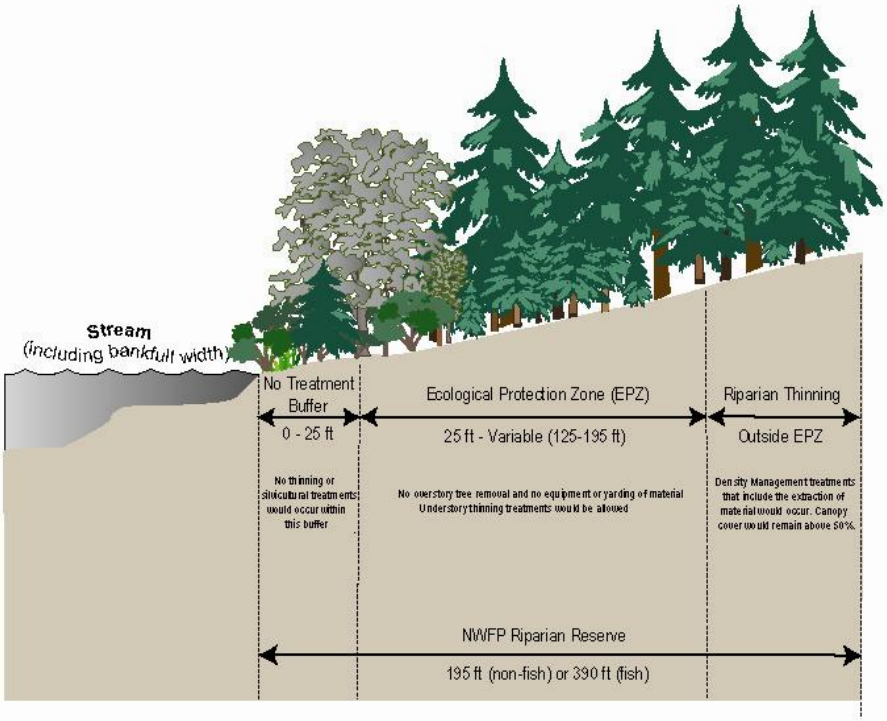
Canopy Visual Representations – Current conditions and Post-treatment

Figure 2. Photograph at left depicts a representative existing canopy cover of approximately 60 % f or stands containing spotted owl dispersal habitat. The photograph at right depicts a representative post treatment at approximately 40% canopy cover to maintain dispersal spotted owl habitat.

Riparian Thinning

Alternative 2 would thin within the Riparian Reserves that are outside the variable width Ecological Protection Zone (EPZ). Canopy closures would remain above 50%, and species diversity would be maintained. See Figure 3 below.

Riparian thinning would improve or maintain stand vigor, promote larger future woody debris, enhance species diversity, reduce the existing fire hazard, and promote fire resiliency. Ecological Protection Zones (EPZ) would be established within Riparian Reserves and would be based on field stream survey information. EPZ width would be measured from the stream bankfull width (by slope distance) and would be applied along streams and perennial springs and seeps to protect stream channel structure and water quality. The EPZ would be a no harvest buffer



Activity Slash

Slash created from thinning under Alternative 2 would be lopped and scattered, chipped on site and/or removed, or handpiled and burned to reduce the fire hazard. Treatment selection would, depend on the amount slash and its distribution within a unit.

Low intensity underburns may occur within 7 years of initial project implementation to reduce fuel loading, ladder fuels and reduce sprouting hardwoods and/or other brush vegetation.

Biomass Removal
Under Alternative 2, whole-tree yarding is the preferred harvest method and would facilitate biomass removal to existing roads and landings. Biomass removal would occur via whole-tree yarding or yarding with attached tops to reduce ground disturbance and fuel loading.

Road Work
Under Alternative 2, approximately 2.2 miles of temporary spur route construction would occur to facilitate the removal of commercial products and biomass. Temporary spur routes are not intended to be part of the permanent or designated transportation network system and would be decommissioned after use. Temporary spur routes would be returned as close as possible to pre-treatment conditions by ripping, mulching, and seeding. Temporary spur routes would be barricaded after use. No construction of permanent roads would occur under Alternative 2 .

Road maintenance would occur as needed on approximately 17 miles of existing road. Road maintenance activities would occur on existing roads to keep the road at its original design standard. Work would include road blading and reshaping, spot rocking and surface replacement, ditch cleaning, culvert inlet and outlet cleaning, culvert replacement, and removing vegetation along roadsides to improve site distance.

2.3 Best Management Practices and Project Design Features

Best Management Practices (BMPs) are required by the Federal Clean Water Act to reduce nonpoint source pollution to the maximum extent practicable. The BMPs are methods, measures, or practices selected from Appendix D of the 1995 ROD/ RMP to ensure that water quality will be maintained at its highest practicable level. BMPs in this Section are noted by an asterisk *. Project Design Features (PDFs) are specific measures included in the site specific design of the Proposal to eliminate or minimize adverse impacts on the human environment

- *Slumps, intermittent seeps, and other unstable areas would be buffered (no treatment) by leaving one row of overstory trees or a 25 foot radius (whichever is greatest), from the outer edge of instability around these areas for soil stabilization (RMP, p. 154).

- *Material removed during excavation would only be placed in locations where it cannot enter streams or other water bodies (RMP, p. 162)

- *Restrict ground-based yarding to slopes less than 35% in order to prevent excessive soil disturbance (RMP, p. 166).

2.3.1 Soil Productivity, Residual Trees, and Coarse Woody Debris

- Existing skid trails would be utilized whenever practical. New skid trails would be pre-designated and approved by the Authorized Officer.

- Ground-based yarding would generally be limited to slopes less than 35%. Ground-based logging would not occur when soil moisture at a depth of 4-6 inches is wet enough to maintain form when compressed, or when soil at the surface would readily displace, causing ribbons and ruts along equipment tracks. These conditions are generally found when soil moisture, at a depth of 4-10 inches is between 15-25% depending on soil type.

- Productivity loss resulting from topsoil disturbance and soil compaction would not exceed a combined calculated total of 5%t.

- Whole tree yarding with tops attached to the last log would be permitted as long as contractor can operate without causing unacceptable damage from bark slippage, girdling, broken tops, or damage to live crowns. If it is determined by the Authorized Officer that unacceptable amounts of damage is occurring, trees would be required to be bucked and limbed as directed by the Authorized Officer. Delivered log length not to exceed 41 feet.

- Within harvest units, the total compacted area, which includes the use of compacted pre-existing skidtrails, would be reduced to less than 12% upon completion of harvest. To reduce soil compaction, minimize sedimentation, and improve site productivity temporary routes and temporary landings would be rehabilitated by discontinuously sub-soiling, seeding, water-barring, mulching, and blocking prior to October 15 of the year of harvest. For all sub-soiling, a winged ripping device would be used to sub-soil the full width of the skid trail, rips would be no more than 36 inches apart, and would be to a depth of 18 inches or to bedrock, whichever is shallower. All rehabilitation activities that utilize heavy equipment would be required to take place at same time as sub-soiling to prevent machinery from driving back over sub-soiled ground.

- Tractors would be equipped with an integral arch to minimize soils disturbance and compaction.

- To minimize soil disturbance the use of blades while tractor yarding would not be permitted. Equipment would walk over as much ground litter as possible to reduce compaction.

- Harvest equipment used off of designated skidtrails would operate on ground less than 35% slope, have an arm capable of reaching at least 20 feet and minimize turning. When practical, the harvest equipment must walk on a mat of existing or created slash. To prevent operations from exceeding the maximum 5% soil productivity loss, equipment use may be restricted depending on soil type, soil moisture, ground pressure of the equipment, and presence of slash to operate on.

- Merchantable sawlogs would be removed from yarded material, and any remaining debris at the landing sites would be piled and burned on the immediate downhill side of existing roads, chipped, or removed for biomass utilization.

- Activity slash remaining in units would be lopped-and-scattered, chipped, or handpiled and burned to prevent an increase in fire hazard.

- Firelines would be constructed by hand.

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

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

- All non-hazardous snags would be retained in all harvest units. If it is necessary to fall snags for safety reasons, they would remain on site as down wood. All existing naturally occurring dead and down woody debris would remain on site.

- A minimum 20 foot distance on the ground would be cleared activity slash around each landing pile to prevent escaped fire. Each landing pile would be covered with a large enough piece of 4 mil black plastic to ensure a dry ignition spot (generally 10 ft x 10 ft or large enough to cover 80% of the pile). To minimize scorch and mortality, landing piles would not be placed adjacent to or within 15 feet of leave trees. To facilitate desired consumption, landing piles would be as free of dirt as reasonably possible.

- Each hand pile would be covered with a large enough piece of 4 mil black plastic to ensure a dry ignition spot (generally 5 ft x 5 ft or large enough to cover 80% of the pile). To minimize scorch and mortality, hand piles would not be placed adjacent to or within 10 feet of leave trees or large woody debris.

- Piles would be burned in the fall to spring season after one or more inches of precipitation have occurred. Patrol and mop-up of burning piles would occur when needed to prevent treated areas from reburning or becoming an escaped fire.

- Prescribed fire burn plans would be completed before ignition, as would smoke clearance to minimize impacts on air quality.

- Slash piles would not be allowed on roadways, turnouts, shoulders, or on the cut bank

Fragile Soils

Fragile Grade Restricted (FGR) for road work

Temporary routes proposed on FGR areas would not be located on or above a headwall or on slopes in excess of 70% .

Routes on FGR areas will be constructed, utilized, and decommissioned during the dry season of a single year (FGR).

- On FGR areas, routes would be located on the upper slope or ridge, and would not cross through any Riparian Reserves.
- All temporary routes would be blocked and decommissioned following use on FGR areas, including subsoiling, mulching, water-barring, and placement and stabilization of fill material back over the route bed where cut and fill construction was needed.
- Additional drainage features that are added during road maintenance activities on FGR would be located away from steep draws and would be designed to disperse water back into the hillside.
- Downspouts or energy dissipaters would be utilized for drainage outlets on FGR soils areas.

Fragile Grade Restricted for burning

- Lop-and-scatter activity slash over yarding corridors then across remaining FGR soils in unit. Where slash quantity is such that lop-and-scatter treatment alone would result in an increase in the fire hazard classification, handpile and burn high concentration areas outside yarding corridors.

Fragile Grade Restricted logging (Units 11-1L, 11-3L, and11-4L)

- All logging operations would be limited to the dry season (May 15-Oct 15);
- units would be yarded using full or partial suspension;
- hand waterbars would be constructed within cable corridors on these units immediately following use on slopes in excess of 65%, and in areas where bare soil occurs on slopes under 65%;
- activity slash would be placed on bare soils within yarding corridors and below landing sites;
- landing locations would not be placed on slopes over 70% or directly above draws.

2.3.2 Air Quality / Smoke Management

- All prescribed burning would be managed in a manner consistent with the requirements of the Oregon Smoke Management Plan administered by the Oregon Department of Forestry and the regulations established by the Air Quality Division of the Oregon Department of Environmental Quality.

- Local residents would be advised of prescribed burning prior to seasonal burning through news releases.

2.3.3 Cultural Sites

- Prior to any project implementation under this Fire Resiliency EA, a cultural resource survey would be completed and site-specific protection measures would be implemented to preserve the integrity of all recorded cultural sites, referred to as Historic Properties in cultural resource protection laws and regulations.

- If cultural resources are found during project implementation, the project would be redesigned to protect the cultural resource values present, or evaluation and mitigation procedures would be implemented based on recommendations from the Resource Area archaeologist with concurrence from the Field Manager and State Historic Preservation Office.

2.3.4 Noxious Weeds

- Seed and straw used for restoration, replanting of bare soil, and post treatment throughout the Planning Area would be native species and certified weed free to prevent the further spread of noxious weeds. All seeding would be contingent on seed availability.

- In order to prevent the potential spread of noxious weeds into the Medford District BLM, the operator would be required to clean all logging, construction, chipping, grinding, shredding, rock crushing, and transportation equipment prior to entry on BLM lands.

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

- Only equipment inspected by the BLM would be allowed to operate within BLM lands. All subsequent move-ins of equipment as described above shall be treated the same as the initial move-in.

- Prior to initial move-in of any equipment, and all subsequent move-ins, the operator shall make the equipment available for BLM inspection at an agreed upon location off federal lands.

- Noxious weeds within BLM lands would be surveyed and treated for noxious weeds as funding is available. Treatments would primarily consist of herbicide application, hand pulling, and mechanical cutting methods as analyzed in the Medford District Integrated Weed Management Plan and Environmental Assessment (USDI 1998).

2.3.5 Streams and Riparian Zones

- *On all units, a minimum 25 foot no treatment buffer, from bankfull width, would be used to protect streambank stability.

- *Within the variable width ecological protection zone (EPZ), canopy closure would remain at existing levels and vegetative species diversity would be maintained. Understory thinning activities would be allowed.

- *Treatments within the Riparian Reserve that are outside the variable width ecological protection zone would be maintain canopy closures above 50%.

- *Unless unsafe, trees within riparian reserve boundaries (195') would be directionally felled away from the stream, and adjacent trees would not be felled into Riparian Reserves.

- Springs and perennial wet areas would receive a radial buffer that would prohibit any overstory canopy removal or ground disturbance. This buffer would extend outward from the edge of the riparian vegetation for a distance equal to the EPZ width designated for that unit, or 100 feet (whichever is smaller), in order to protect the ecology of these sites.

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

- Upon completion of harvest, all utilized skid trails within riparian reserves would be discontinuously sub-soiled, seeded, water-barred, mulched and blocked

- Hydraulic fluid and fuel lines on heavy mechanized equipment would be in proper working condition in order to minimize potential for leakage into streams. No re-fueling of heavy equipment would occur within 150 feet of streams or stream crossings. Absorbent materials would be required to be onsite to allow for immediate containment of any accidental spills.

- Flowing water would be diverted around each culvert or cross drain installation or removal site whenever there is sufficient water volume. Diverted water would be returned to the channel immediately downstream of the work site. Effective erosion control measures would be in place at all times during installation or removal, and would be removed from the channel prior to October 15th of the same calendar year. Stored sediment behind erosion control devices would be removed from channel and disposed of in a stable location outside the EPZ.

- *Prior to winter rains, cable yarding corridors that are above or nearly perpendicular (approximately 60-90 degrees) to stream channels within Riparian Reserves, or hydrologically connected to ditchlines would be waterbarred to protect water quality (Best Management Practice, RMP p.167).

- *Skid trails utilized within Riparian Reserves, and all temporary and reconstructed routes would be decommissioned after use, and landings built or expanded would be rehabilitated. This would involve discontinuous subsoiling (Davis, pp. 138 & 139) to depth of 18 inches with winged ripping teeth, mulching with weed free straw and/or native grass/forbs mixtures, water-barring and barricading. Subsoiling, water-barring, and mulching would be accomplished in a single pass to avoid driving back over subsoiled areas or waterbars. Subsoiling may be accomplished with any number of winged ripping teeth, as long as rips are located no more than 36 inches apart upon completion.

- Fires would be allowed to back into Riparian Reserve no-treatment areas, but no ignition would take place within the no treatment areas.

- Fire suppression foam would not be used within 150 feet of streams and wetland.

- Refueling of chainsaws and pumps would be done no closer than 150 feet of any stream or wet area. Spilled fuel and oil would be cleaned-up and would be disposed of at an approved disposal site.

- Contractors must prepare a Spill Prevention, Control, and Countermeasure Plan for all hazardous substances to be used in the contract area, as directed by the Authorized Officer. Such plan shall include identification of Purchaser's representatives responsible for supervising initial containment action for releases and subsequent cleanup. Such plans must comply with the State of Oregon DEQ OAR 340-142, Oil and Hazardous Materials Emergency Response Requirements.

- *Avoid blading and vegetation removal unless necessary to remove drainage impediments when maintaining inboard ditches. Sediment control measures willbe evaluated and implemented if necessary, where ditchline blading is required within 100 feet of streams.

- Handpile burning and underburning operations would be required to wait a minimum of 12 months following the implementation of adjacent density management treatments in order to ensure ground vegetation that could be trapping erosion from yarding activities is not removed.

2.3.6 Sedimentation and Soil Compaction

- Temporary routes, skid trails, and road renovation/improvement construction would not occur when soil moisture, at a depth of 4-6 inches, is wet enough to maintain form when compressed; or when soil at the surface would readily displace, causing ribbons and ruts along equipment tracks. These conditions are generally found when soil moisture at a depth of 4-10 inches is between 15-25% depending on soil type.

- Landings used during dry conditions within the wet season (October through May) that have the potential to release sedimentation into a stream or wet area, would have silt fencing or other sediment control measures in place during periods of non-use if they are hydrologically connected to streams.

- All natural surface or rocked roads that are re-opened for harvest operations or log haul would receive adequate surfacing, be gated, or be blocked prior to the wet season and stabilized in such a way that no future maintenance would be necessary to prevent road damage or stream sedimentation.

- *Prior to October 15 of the same operating season, winterization and rehabilitation would occur on temporary routes, landings, corridors, skid trails, and other areas of exposed

soils by properly installing and/or using water bars, berms, sediment basins, gravel pads, hay bales, small dense woody debris, seeding and/or mulching, to reduce sediment runoff as directed by the Authorized Officer.

- Non-emergency road maintenance work shall occur during the dry season (generally between May 15 and October 15). Certain activities (blading of aggregate roads, rocking, brushing, cross drain installation) occurring a minimum of 200 feet away from any stream may be permitted during the wet season (generally Oct 15 -May 15) when conditions are dry. When dry conditions are experienced outside seasonal restrictions, coordination with area specialists for agreement on the activity needs to occur. No ditch maintenance shall occur during the wet season unless for safety or resource protection. Work shall be suspended during precipitation events or when observations indicate that saturated soils exist to the extent that there is visible runoff or a potential for causing elevated stream turbidity and sedimentation. Emergency road work may be permitted during the wet season.

- Avoid blading and vegetation removal unless necessary to remove drainage impediments when maintaining inboard ditches. Sediment control measures will be evaluated and implemented if necessary, where ditchline blading is required within 100 feet of streams.

- Waste material from road maintenance activities would be placed in stable disposal areas a minimum of 200 feet from any stream and in a location where sediment laden runoff can be confined. Where necessary, provide erosion control to minimize sediment delivery to streams.

- *Landings and landing piles would be placed outside of Ecological Protection Zones. Landings used during dry conditions within the wet season (October through May) that have the potential to release sedimentation into a stream or wet area via road ditchlines or other surface transport mechanisms, would have silt fencing or other sediment control measures in place during periods of non-use if they are hydrologically connected to streams.

- *Where hydrologically connected, log hauling on natural surface and rocked roads would not occur under wet conditions to protect water quality. Surface displacement such as rutting or ribbons, continuous mud splash or tire slide, fines being pumped through road surfacing from the subgrade, road drainage causing a visible increase in stream turbidities, or any condition that would result in being chronically routed into tire tracks or away from designed road drainage during precipitation events (RMP, p. 166).

- *All natural surface or rocked roads that are re-opened for harvest operations or log haul would receive adequate surfacing for winter use (generally 6-12 inches of clean rock), be gated prior to the wet season, or would be blocked prior to the wet season and stabilized in such a way that no future maintenance would be necessary to prevent road damage or stream sedimentation.

2.2.7 Wildlife

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

- Work activities (such as tree felling, yarding, temporary route construction, road renovation/improvement, hauling on roads not generally used by the public, and prescribed fire) would not be permitted within specified distances (see table 1 below), of any nest site or activity center of known pairs and resident singles between March 1 and June 30 (or until two weeks after the fledging period) – unless protocol surveys have determined the activity center to be not occupied, non-nesting, or failed in their nesting attempt. March 1 – June 30 is considered the critical early nesting period; the restricted season may be extended during the year of harvest, based on site-specific knowledge (such as a late or recycle nesting attempt). The boundary of the prescribed area may be modified by the action agency biologist using topographic features or other site-specific information. The restricted area is calculated as a radius from the assumed nest site (point).

Harassment distances from various activities for spotted owls (BLM 2009)

Activity	Buffer Distance around Owl Sites
Heavy Equipment (including non-blasting quarry operations)	105 feet
Chain saws	195 feet
Prescribed fire	0.25 miles

Retain snags and coarse woody material (CWM) > 12” dbh except for safety or operational reasons except as noted below for spotted owl nest patches.

- Prior to prescribed burning, duff would be pulled away from the base of snags to reduce the chance of losing them during burning.

Coarse woody material would be retained and protected from disturbance to the greatest extent possible during burning and other project activities.

Chapter 3.0 Affected Environment and Environmental Consequences

3.1 Introduction

In accordance with law, regulation, executive order, policy and direction an interdisciplinary team reviewed the elements of the human environment to determine if they would be affected by the alternatives described in Chapter 2.0. The Affected Environment portion of this chapter describes the current conditions in the Fire Resiliency Planning Area and the relevant resources that could be potentially affected. The Environmental Consequences provides the analytical basis for the comparisons of the alternatives (40 CFR § 1502.16) and the reasonably foreseeable environmental consequences to the human environment that each alternative would potentially have on the relevant resources. Impacts can be beneficial, neutral or detrimental. This analysis considers the direct impacts (effects caused by the action and occurring at the same place and time), indirect impacts (effects caused by the action but occurring later in time and farther removed in distance but are reasonably foreseeable) and cumulative impacts (effects caused by the action when added to other past, present and reasonably foreseeable future actions on all land ownerships). The temporal and spatial scales used in this analysis may vary depending on the resource being affected.

Cumulative Effects
As the Council on Environmental Quality (CEQ), in guidance issued on June 24, 2005, points out, the "environmental analysis required under NEPA is forward-looking," and review of past actions is required only "to the extent that this review informs agency decision-making regarding the proposed action." A description of current conditions inherently includes the effects of past actions and serves as a more accurate and useful starting point for a cumulative effects analysis than by "adding up" the effects of individual past actions. "Generally, agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions." (CEQ Memorandum 'Guidance on the Consideration of Past Actions in Cumulative Effects Analysis' June 24, 2005.)

When encountering a gap in information, the question implicit in the Council on Environmental Quality regulations on incomplete and unavailable information was posed: is this information "essential to a reasoned choice among the alternatives?" (40 CFR §1502.22[a]). While additional information would often add precision to estimates or better specify a relationship, the basic data and central relationships are sufficiently well established that any new information would not likely change relationships or conclusions. Although new information would be welcome, the team did not identify any missing information as essential for the Decision Maker to make a reasoned choice among the alternatives.

The IDT weighed the scientific evidence offered through public comments, as well as that gathered by each resource specialist. Scoping for this project did not identify any need to exhaustively list individual past actions or analyze, compare, or describe the environmental effects of individual past actions in order to complete an analysis which would be useful for illuminating or predicting the effects of the proposed action.

Planning Area Overview

The Planning Area is located within the South Umpqua Subbasin, in the Middle Cow Creek and Lower Cow Creek Watersheds. A watershed is defined as the 5th field hydrologic unit level. The Middle Cow Creek Watershed is approximately 113,120 acres or 176.8 mi^2. The Lower Cow Creek Watershed is approximately 102,386 acres or 160.0 mi^2. A sub-watershed refers to a smaller, 6th field hydrologic unit. For affected sub-watersheds in this Planning area, the sub-watersheds vary from about 21- 43 square miles.

Table 1

Watershed (5th field)	Sub-watershed (6th field)	Area* (mi2)	Area* (Acres)	Density Management Acres	Understory Thinning Acres	Percent of Sub-watershed
Middle Cow Creek	Dads Creek-Cow Creek	24.6	15,748	22	16	0.2
	McCullough Creek- Cow Creek	21.7	13,922	149	248	2.9
	Windy Creek	24.5	15,657	261	198	3.0
Lower Cow Creek	Middle Creek	42.1	26,959	0	6	0.02
Totals		112.9	72,286	432	468	0.6

The Planning Area is within the Klamath Mountains Ecoregion and has a Mediterranean type of climate characterized by cool, wet winters and warm, dry summers. Temperatures range from 0 degrees (F) on King Mountain in January to 110 degrees in the interior valleys in August. Extended summer drought is common. The majority of precipitation is in the form of rain; however, some snow is likely at higher elevations in most years. Precipitation varies from near 30 inches per year in the interior eastern valleys to approximately 60 inches/year in the western portions. Approximately 90 percent of the yearly total falls in the months October to May. The volume of stream flow closely parallels the precipitation pattern. Peak stream flows occur from November to March, and low stream flows occur from July to October. Small 1st and 2nd order headwater streams are often intermittent and have no surface flow during the dry season in most years. Intermittent and small perennial streams are located within or adjacent to several of the proposed treatment units (see maps).

Management of BLM lands within these HUC 5 watersheds is divided between the Glendale Resource Area (RA) of the Medford District BLM and the South River RA of the Roseburg District BLM. Proposed units and haul roads for this Project are within the Glendale RA portion of these watersheds. The Middle Cow Creek Watershed Analysis (WA) and Middle Cow Creek Water Quality Restoration Plan (WQRP) cover the Middle Cow Creek HUC 5 watershed. These documents can be reviewed on the Medford District BLM website at http://www.blm.gov/or/districts/medford/plans/inventas.php and http://www.blm.gov/or/districts/medford/plans/activityplans.php, respectively. The Lower Cow Creek Watershed Analysis and Water Quality Restoration Plan, covers the Lower Cow Creek Watershed. It is available for review on the Roseburg District BLM website at http://www.blm.gov/or/districts/roseburg/plans/inventas.php.

3.2 Soil Erosion and Sensitive Soils

3.2.1: Affected Environment Soil Erosion and Sensitive Soils

The affected environment for soil erosion and sensitive soils include proposed treatment units and areas 50 foot either side of haul roads. These potential impacted areas will be referred to as the "treatment areas." If the analysis shows an unexpected impact resulting in soil impacts outside the treatment areas the extent of this analysis will be expanded. Where this analysis identifies that soil erosion would be transported offsite into streams or other hydrologically connected conduits, impacts will be analyzed within Section 3.4 Water Quality: Stream Sedimentation. Providing an analysis for this element at a larger scale would remove all measurable impacts, and eliminate any meaningful discussion of the effects.

Soil Types
Typical soils and soil complexes in this Planning Area formed in residuum (i.e., weathered in place) and colluvium (i.e., material rolling downhill) from sandstone, siltstone, volcanic and metamorphic rock. Soils in vary from clay loam to extremely gravelly loam in the surface horizon, with a moderate erosion hazard on slopes under 30%, and a moderate to high hazard of erosion on steeper slopes. Ssoils are generally well-drained and moderately deep (20-80^{+} inches to bedrock), with some local areas of shallow soils on ridgetops and rock outcrops. Soils are suited primarily for growing Douglas fir. Soil maps and descriptions of project soil characteristics are available at the USDA Natural Resource Conservation Service web site: http://www.or.nrcs.usda.gov/pnw_soil/or_data.html. The major management limitations and soil characteristics identified by NRCS for the soils and soil complexes found within the Planning Area were used in the selection of proper Best Management Practices (BMPs) and Project Design Features (PDFs) that have been incorporated into the Fire Resiliency Project.

Sensitive and Fragile Soils
Portions of the Planning Area are classified as having category 1 and 2 sensitive soils as described in the Medford RMP; soils with moderate burn damage potential as classified by NRCS; and areas of fragile and reforestation limited soils under the Timber Production Capability Classification (TPCC) Handbook (BLM 1986).

Category 1 and 2 soils are described within the Medford RMP in respect to silviculture site preparation and prescribed burning. These classes of soils need to be burned during spring-like conditions when maximum duff layer retention can be attained and minimum course woody debris and snag retention requirements (as described in C-40 SEIS ROD) can be achieved. These soils will only be discussed in the alternatives for actions that involve prescribed burning.

Where NRCS classification of moderate potential for burn damage occurs there could be negative impacts to soil characteristics, but "fair performance of future growth and establishment can be expected" (http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx). These soils will only be discussed in the alternatives for actions that involve prescribed burning.

TPCC classifications within the Planning Area include Fragile-Slope Gradient-Suitable (FGR), Reforestation-Temperature-Suitable (RTR), Reforestation-Moisture-Suitable (RMR),

Reforestation- Surface Rock and Moisture-Suitable (RSMR), and Reforestation-Temperature and Surface Rock-Suitable (RTSR). Fragile-Slope Gradient-Suitable sites are considered suitable for commercial harvest actions but have higher instances of debris type landslides and unacceptable levels of surface erosion if implemented without site specific PDFs or BMP's. Without the application of specific protection measures, these sites can be prone to excessive soil displacement, and where hydrologically connected, stream sedimentation. Burning on these sites is also restricted under the Medford RMP. Further information on these classifications can be found in the BLM Handbook 5251-1 (BLM 1986).

TPCC classifications for RTR, RMR, RSMR, and RTSR sites have reforestation difficulties rather than impacts to the physical structure and stability of the soils. All harvest treatments under the Fire Resiliency Project are thinning actions, underburning, or handpile burning treatments. As such, leave trees and natural reforestation would meet the minimum restocking guidelines under the NWFP, and tree planting on these sites would not be needed. "These sites will meet or exceed minimum stocking levels of commercial species within 5 years of harvest using operational practices," (BLM, 1986). Burning is not restricted on these sites unless they overlap category 1 or 2 soils. These soils will only be discussed for alternatives in this section where vegetation removal could impact restocking. See section 3.5 Productivity for additional information.

Map 8 of the Middle Cow Creek Watershed Analysis (WA) identifies broad areas that may be prone to soil instability, mass failure, or sedimentation within the Middle Cow Creek portion of this Planning Area. This information is compiled broadly and is not based on site specific field review. As such, these areas are cautiously assessed during site specific field review. The field data collected ultimately determines the specific areas where timber management is suitable. Map 21 of the Lower Cow Creek WA and WQRP displays areas of fragile soils under the TPCC classification and Map 22 identifies category 1 sensitive soils for the Lower Cow Creek portion of this Planning Area.

Proposed treatment units do not overlap TPCC withdrawn (non-suitable) areas. All units have category 1 or 2 soils. The north portion of 1-1L and portions of 1-2R, 1-3R, 6-1R, 7-1R, and 11-1R all have areas where moderate burn damage could occur under the NRCS classification. TPCC classifications for Lawson units Units are shown in Maps in Appendix 3

Erosion

Primary sources of accelerated erosion (above natural levels) in these sub-watersheds are forest management activities and roads. Forest management activities including road, skid trail, and landing construction, yarding, and broadcast burning have augmented natural erosion events within these watersheds. Soil displacement and compaction occurs during forest management operations when mechanized harvesting or yarding equipment is driven over or yards timber across poorly vegetated, weak, or wet soils. Vegetative cover reduces the particle detachment rate, and through the binding capacity of root masses, the sediment transport rate (NOAA Fisheries, 2004, (Larson and Sidle, 1981; Harvey et al. 1994). Therefore surface erosion, from disturbed soils that are not compacted, is normally greatly diminished within 1-3 years, following the regrowth of vegetation. Soils protected by litter are also less prone to erosion (SOLO, 2006; Rothacher and Lopushinsky 1974). Decommissioning that includes subsoiling

can greatly reduce the recovery period for compacted soils. Erosion from decompacted sites would be similar to those discussed for soil displacement. In cases where compacted soils have not been rehabilitated, erosion and other soil impacts can persist for 40- 80 years, or more (Wert and Thomas, 1981).

Erosion from past timber management actions in the treatment areas has generally subsided. Evidence of past actions is essentially only visible within units where skid trails or landings were not rehabilitated following use. This area is estimated to account for roughly 65 acres within the proposed treatment units. There are also 99 acres of understory thinning and burning that has occurred within the treatment areas in the last 5 years. There is no evidence within treatment units of any persisting accelerated erosion as a result of these treatments.

Some roads in this sub-watershed show evidence of surface erosion, inadequate drainage, inadequate stream crossings or unstable cut-banks and fill slopes. All roads contribute to accelerated erosion at different levels depending on the surface type, type of use, location, maintenance frequency, and moisture levels of the road surface during use. Existing roads proposed for haul and maintenance are rocked and native surface. Rocked roads proposed for haul within this project overall have good surface conditions and adequate drainage. These roads would be expected to have low levels of erosion unless utilized for hauling under wet conditions. Native surface roads proposed for haul tend to have weak soil bases that become vulnerable to excessive erosion when wet. All haul roads are adjacent to TPCC restricted classifications on BLM lands.

Accelerated erosion is also a result of the blading of road surfaces, the use of inadequately rocked and natural surface roads, wet weather hauling, ditchline maintenance, an insufficient number of cross drain culverts, undersized or poorly placed cross drain culverts. Poorly located roads can additionally cause increased channelization of hillslopes and mass wasting (Wemple and Jones, 2003).

3.2.2 Environmental Consequences Soil Erosion and Sensitive Soils

3.2.2.1 Alternative 1 (No Action) Effects to Soil Erosion and Sensitive Soils

Erosion from land management actions across all ownerships within these sub-watersheds would be expected to remain consistent with current levels over the long term, but may vary from year to year. While some new roads would be constructed, erosion from roads is likely to remain at current levels or may even decrease in the future since road design and construction practices have been greatly improved from the practices used when legacy roads were constructed. Older legacy roads in poor locations, or that were poorly constructed would likely continue to be decommissioned and rerouted, or upgraded in the future as projects and funding occurs.

It would be expected that new harvest actions would be implemented across all ownerships that would result in erosion and compaction. Where compacted acres from past road construction and timber extraction are not associated with actively maintained road systems, soils would continue to improve slowly over time as tree roots and other natural processes begin to break apart soil particles, eventually resulting in a reduction in compaction on these acres. During this period, some areas would experience an increase in erosion due to gullies and rills that form on

compacted and unmaintained skid trails. These acres would likely reestablish full hydrologic and soil functions within 40-80 years, depending on soil type and condition at the time of harvest (Wert and Thomas, 1981).

Broadcast burning, pile burning, and other activity fuels treatments would be expected to continue on non-federal lands under the No Action Alternative. All actions would be required to be done in accordance with Oregon Forest Practices Act requirements. Treatment of activity fuels and site preparation of units will likely result in accelerated erosion, stream sedimentation, and localized chemical alterations to the soil and water.

The extent of the impact to water quality from non-federal harvest related actions is not known. However, due to improved practices the magnitude of these impacts would be expected to be equal to or less than those that have occurred during past timber management activities and would be expected to be compliant with the Clean Water Act.

Under Alternative 1, erosion would occur in conjunction with scheduled and emergency road maintenance activities under the Medford Road Maintenance Categorical Exclusion. These actions would be limited to within the road right of way and would be done using BMP's to protect from offsite erosion. These road activities are ongoing actions on Medford BLM lands, and have been further refined to reduce the instances and magnitude of offsite or excessive erosion. These actions would therefore be expected to maintain or reduce current erosion levels from roads in the future.

The Rueben Fuels Project includes 1,076 acres of hazardous fuel reduction treatments, of which 432 acres would have biomass removal. Associated harvest activities include 57.3 miles of existing road maintenance. This project will occur within four HUC 6 sub-watersheds. Of these, Dads Creek-Cow Creek and McCullough Creek Cow Creek overlap the Rattlesnake portion of this Planning Area. Reuben Fuels was analyzed under the Revised Reuben Hazardous Fuel Reduction Project Environmental Assessment (Oct, 2010). The analysis showed that a total of 76 acres would be displaced resulting in onsite erosion, and that road maintenance and haul would result in low levels of erosion that would remain onsite or except at stream crossings (discussed in Section 3.4 Sediment). There are no overlapping units between Reuben and Fire Resiliency Project.

There are two understory thinning and fuels reduction projects that will occur in these sub-watersheds. The Westside Hazardous Fuels Reduction project will burn handpiles on up to 220 acres and will underburn up to 210 acres. The Young Stand Management project will pre-commercial thin, brushing, and prune approximately 1,000 acres. These treatments would result in low levels of onsite erosion and due to BMPs would not affect water quality. These projects would not occur within Fire Resiliency proposed treatment units.

There is one restoration activity under the Middle Cow Creek Restoration Project within these subwatersheds. It is an instream log placement that will occur on Rattlesnake Creek. This action will place logs instream in 25-30 locations along an approximately ¾ mile reach of Rattlesnake Creek, upstream of Stevens Creek. Logs will be trucked in from an offsite location and will be yarded into the stream using ground based equipment. The effects of this project were analyzed

in the Aquatic and Riparian Habitat Enhancement EA. Erosion would occur from the use of equipment, and as a result of bank and channel disturbance from yarding and anchor point development. Erosion from these actions would result in offsite erosion within Rattlesnake Creek (see Section 3.4 Water Quality: Stream Sedimentation). Erosion extent and transport distance would be minimized through the use of PDFs and BMP's as identified in the Aquatic and Riparian Habitat Enhancement EA.

Soil impacts resulting in erosion as a result of all federal projects discussed above is consistent with the impact analysis and

3.2.2.2 Alternative 2 Effects to Soil Erosion and Sensitive Soils

Management actions proposed under Alternative 2 would result in soil displacement and erosion in the treatment areas. Field surveys were used to identify and defer all areas that have the potential to result in chronic erosion, excessive soil displacement, or landslides. BMPs and PDFs were then identified and incorporated into the Fire Resiliency Proposed Action to address the remaining general management concerns identified for each soil type. Following incorporation of these BMPs and PDFs, offsite erosion would be limited to during hauling and maintenance activities on roads via ditchlines and at stream crossings. All other road use, temporary route construction and reconstruction (including associated decommissioning), skid trail construction and decommissioning, landing construction and rehabilitation, yarding operations, activity fuels, and understory thinning treatments proposed under Alternative 2, would result in localized increases in accelerated onsite erosion that would persist for 1-3 years. Below is the description of all activities that would result in accelerated onsite erosion. Offsite erosion and stream sedimentation from road maintenance and haul is discussed in Section 3.2 Water Quality: Stream Sedimentation. All other critical environmental elements, related to soil erosion and water resources, not affected by Alternative 2 are addressed within Appendix 2 of the EA.

Roads

- *Temporary Route Construction, Reconstruction, and Decommissioning*

There is a total of 2.2 miles temporary route construction/reconstruction, and subsequent decommissioning proposed for access to units and extraction of materials using uphill cable yarding. Of these, 0.1 miles is proposed on FGR for extraction of materials from a portion of unit 11-1L. Specific placement of all proposed temporary routes will address accelerated erosion, raveling, and sliding concerns typically identified for road/route construction on fragile FGR soils through the following PDFs.

Proposed temporary routes would not be located on or above a headwall or on slopes in excess of 70%.

Routes will be constructed, utilized, and decommissioned during the dry season of a single year.

- Routes would be located on the upper slope or ridge, and would not cross through any Riparian Reserves.

- All temporary routes would be blocked and decommissioned following use, including subsoiling, mulching, water-barring, and placement and stabilization of fill material back over the route bed where cut and fill construction was needed.

Through implementation of these project design features, temporary route construction, reconstruction, and decommissioning impacts to soils would be minimized. There would be a short term impact to soil function on approximately 3.7 acres, as well as an increase in onsite erosion for 1-3 years until ground vegetation recovers. Since all temporary routes would be subsoiled, stabilized, and blocked, and none of these routes would be hydrologically connected to streams, proposed temporary routes would not result in any change to watershed hydrology or water quality.

- **Haul Activities and Road Maintenance**

There are 17 miles of existing road and 2.2 miles of new temporary routes proposed for haul and maintenance. Of these, 11.7 miles are rocked and 7.5 miles are native surface. Because all access routes to analysis areas are hydrologically connected, hauling would be restricted to the dry conditions on all roads.

Under Alternative 2, rocked and native surface haul roads would receive road surface, ditchline, and culvert maintenance as necessary to protect the integrity and drainage of the road during use. Newly constructed or reconstructed temporary roads would be utilized and decommissioned with little or no maintenance activities. The proposed haul and road maintenance on rocked and natural surface roads would contribute to accelerated erosion at different levels depending on the moisture levels of the road surface during haul, and the type of maintenance applied. Utilizing roads for haul only during dry conditions would minimize the amount of erosion. All roads would be maintained as necessary to prevent road damage and excessive erosion.

All haul routes are located on TPCC restricted soils. Primarily TPCC soils adjacent to haul roads are for reforestation restrictions that require PDF implementation to meet forested stocking levels. There would be no impact to these reforestation soil classifications from road maintenance or haul actions because road right-of-ways are permanently excluded from the timber base, and stocking levels do not need to be maintained.

On approximately 0.8 miles, road maintenance actions could be performed on FGR lands where needed. Road maintenance activities such as road and ditchline shaping, blading, brushing, and spot-rocking, in areas where subgrades, surfacing, or ditchlines are in poor condition, would result in episodic instances of accelerated erosion within the first season, but would result in an overall improvement of existing drainage and reduce chronic erosion. To minimize the amount of erosion from hauling and road maintenance activities on FGR soils the following PDFs would be used.

additional drainage features that are added during road maintenance activities on FGR, would be located away from steep draws and would be designed to disperse water back into the hillside;

downspouts or energy dissipaters would be utilized for drainage outlets on FGR soils

All natural surface roads are hydrologically disconnected from streams. Where hydrologically connected, maintenance and hauling activities on rock roads would result in localized instances of offsite erosion at stream crossings and where roads are adjacent to, and in close proximity to streams. These effects will be discussed further in Section 3.2 Water Quality: Stream Sedimentation.

Density Management (Timber Harvest)*Yarding Corridors, Skid Trails, and Landing Construction*

Under Alternative 2, the construction, use, and rehabilitation of landings, skid trails, and whole tree and cable yarding corridors would result in up to 41.9 acres of compaction and accelerated on-site erosion within treatment units. There are a total of 432 acres within 5 density management units that are proposed for overstory thinning and product extraction under Alternative 2.

A total of 21 acres within 3 density management units would occur on FGR soils. All FGR soils within density management units are located outside of Riparian Reserves. There would also be approximately 8 areas along haul roads that would need approximately 0.25 acres each cleared of overstory and midstory vegetation for use as landings on FGR. Ground cover outside the road prism would remain intact at these sites. These FGR areas have been surveyed in the field to ensure site stability and were found to be suitable for partial suspension logging with the following conditions. To protect these sites and minimize potential erosion consistent with the Medford RMP and Standard Operating Procedures for soils the following PDF's would be implemented.

- All logging operations would be limited to the dry season (May 15-Oct 15);
- units would be yarded using full or partial suspension;
- hand waterbars would be constructed within cable corridors on these units immediately following use on slopes in excess of 65%, and in areas where bare soil occurs on slopes under 65%;
- activity slash would be placed on bare soils within yarding corridors and below landing sites;
- landing locations would not be placed on slopes over 70% or directly above draws.

Implementation of these Project Design Features, as well as the standard project PDF's would greatly reduce the amount of compaction, surface disturbance, and the amount of exposed soil following treatments that would occur as a result of Alternative 2. This would minimize the impacts of this action on soils. PDFs would also eliminate offsite transport mechanisms and keep erosion from yarding, skid trails, and landings onsite and out of streams. .

Riparian Reserve Treatments

Streams in the Planning Area are dependent on large wood to help reduce stream energy, capture sediment and smaller organic debris, create aquatic habitat, and provide other channel and ecosystem functions. Increasing the amount of large wood in streams is a key component of watershed restoration, and the ROD/RMP (USDI 1995) states that we should "Apply silvicultural treatments to restore large conifers in Riparian Reserves."

Of the 432 acres of density management treatments that are proposed, 12 acres would be thinned within the Riparian Reserve. Riparian Reserves proposed for thinning are dominated by smaller

diameter stands of Douglas-fir mixed with some hardwoods. These stands are lacking the multiple canopy structure, large wood debris, downed logs, and large tree structure desired in the Riparian Reserve. Thinning of dense Riparian Reserves would reduce competition on the retained trees for light, nutrients, water and growing space, allowing trees would develop larger canopies, display better vigor and put on diameter growth faster than if left untreated. Treatments within Riparian Reserves would be specifically designed to promote the development of future large woody debris and multi-story canopies. Despite minor increases in soil disturbance on up to 1.1 acres during yarding operations, treatments would improve the overall riparian quality in approximately 20-30 years.

Riparian Reserve stands would be treated using cable yarding to extract usable products and reduce fire danger. There would no landings utilized with the Riparian Reserve. BMP's would be applied to ensure that erosion from these actions remain onsite and do not result in stream sedimentation. A list of BMP's that would be implemented is provided in Section 2.3, Best Management Practices and Project Design Features. Together these BMP's will ensure the following:

- the magnitude and extent of affected area is minimized to reduce erosion;
- compacted areas utilized are rehabilitated and stabilized to protect from chronic erosion and adverse impacts to watershed hydrology;
- Adequate buffers are implemented to protect all components of water quality based on the type, extent, and magnitude of the proposed activities' impact.

Buffers were designed to ensure that erosion remains onsite and water quality is not affected. For density management units, this buffer is referred to as the Ecological Protection Zone (EPZ). The EPZ for streams in this project ranges from 125 to 205 ft from the stream bankfull width (by slope distance). It would be applied along streams to protect stream channel structure and water quality (Best Management Practice, RMP p.154). Each EPZ distance was developed using stated protection criteria for individual elements of the Riparian Reserve including: bankfull and flood stage streambank stability; shade and temperature; surface erosion of streamside slopes; fluvial erosion of the stream channel; soil productivity; habitat for riparian-dependent species; the ability of streams to transmit damage downstream; the role of streams in the distribution of large wood to downstream fish bearing waters; and riparian microclimate. The Ecological Protection Width Needs chart is based on slope and rock type, and takes into account protection of streams from "surface erosion of streamside slopes, fluvial erosion of the stream channel, soil productivity, habitat for riparian-dependent species, the ability of streams to transmit damage downstream, and the role of streams in the distribution of large wood to downstream fish bearing waters" (ROD NWFP, pB-14).

Within the EPZ no overstory trees would be removed and no density management activities would be allowed. If understory treatments to reduce fire hazard are necessary or needed for stand health, they would be allowed within the EPZ up to a no treatment buffer of 25 feet on each side of the stream. Lop-and-Scatter treatments and handpiling would be allowed concurrent with density management treatments occurring outside the EPZ. Handpile burning and underburning operations would be required to wait a minimum of 12 months following the implementation of adjacent density management treatments in order to ensure ground vegetation that could be trapping erosion from yarding activities is not removed. Erosion from understory thinning treatments is minimal and would remain onsite. These types of treatments are performed

using low to moderate burn intensities that leave sufficient vegetation and ground litter on the ground for trapping the small amount of soils that is displaced during these actions. All soil disturbances resulting from these activities would be indistinguishable from background levels within 1-2 years.

Treatments within the Riparian Reserve that are outside the EPZ would maintain a canopy cover above 50% to ensure microclimate is maintained. Tree selected for removal would primarily be suppressed upland conifer species. Within the Riparian Reserve, riparian dependent species and hardwoods would be maintained as necessary to ensure the diversity of the stand. Activities in this area would be designed to ensure that habitat conditions for the wildlife and plant species that use this zone are not degraded.

Implementation of standard PDF's that limit the extent and magnitude of erosion, as well as the EPZs for density management and no treatment zones for understory thinning activities, will ensure erosion remains onsite and water quality is maintained.

Activity Fuels and Understory Treatments within Density Management Units

Understory thinning and burning treatments within density management units will occur as necessary to maintain or reduce the fire hazard on up to 432 acres of Matrix and 12 acres of Riparian Reserve. Of these, 386 acres would occur on Category 1 and 2 soils, and on 13 acres that have a moderate potential for burn damage under the NRCS classification. There are additionally 21 acres of TPCC FGR soils within units that may be treated. There are no FGR soils within the Riparian Reserve of density management units. Within all units activity slash may additionally be treated, as necessary. Both understory thinning and activity fuels treatments would be any combination of lop-and-scatter, hand-piling and handpile burning, or underburning. Lop-and-scatter would not adversely impact sensitive or fragile soils, and would provide additional erosion protection. Handpile burning and underburning would have a localized impact to soils that would be reduced through regulation of the burn intensity and moisture conditions outlined in the burn plan.

To ensure that erosion remains onsite during activity and fuels reduction treatments, and soil damage and erosion are minimized and consistent with those impacts analyzed in the 1994 Medford RMP EIS, all burning activities on sensitive and fragile soils would be implemented under a burn plan that is designed to achieve the following;

- a low intensity burn under spring-like conditions;
- maximizes duff layer retention;
- allows for minimum coarse woody debris and snag requirements under C-40 of the SEIS ROD.
- ignition of units would cease immediately if conditions change during burning and are no longer within the identified range in the burn plan.

Additionally, consistent with the RMP and recommended by the Standard Operating Procedures Guide for soils, the following PDF would be implemented on FGR soils to further reduce impacts to soils and reduce erosion.

- Lop-and-scatter activity slash over yarding corridors then across remaining FGR soils in unit. Where slash quantity is such that lop-and-scatter treatment alone would result in an increase in the fire hazard classification, handpile and burn high concentration areas outside yarding corridors.

The above protection measures incorporate the recommendations for operations on fragile and sensitive soils as advised by the Medford RMP and the BLM standard operational procedures guide for soils (BLM, 2010).

Understory Thinning

Understory Thinning and Burning

Understory thinning and burning is proposed on a total of up to 468 acres. Of these there are 368 acres with Category 1 and 2 soils, 40 acres have a moderate potential for burn damage under NRCS classifications, and 66 acres are located on TPCC FGR soils. There are 144 acres of understory treatments that could occur within the Riparian Reserves. Of these, 7 acres occur on FGR soils. As discussed above, burning on FGR soils would only be implemented as needed to maintain or reduce fire hazard.

Treatments, protection measures, and impacts within these units would be the same as those described above for activity fuels and understory treatments within density management units.

3.2.2.3 Summary of Effects for Soil Erosion

Because of the type of actions proposed and the PDF's that would be implemented, there would be no instances of chronic erosion or excessive soil displacement that would occur as a result of any proposed actions associated with this project. The magnitude and extent of soil erosion from all activities associated with the Proposed Action would be consistent with the impact analysis and conclusions provided in the1994 Medford RMP EIS.

Cumulative effects

There are no known actions proposed or ongoing on non-federal lands that would require hauling on the proposed haul routes. Hauling of trees on Rattlesnake Road for the Rattlesnake instream wood placement project would possibly occur concurrently with hauling actions for Fire Resiliency. Hauling of wood for placement within Rattlesnake Creek would require up to 25 truckloads to be driven on the lower portion of Rattlesnake road. Hauling for the Rattlesnake wood placement project would occur during the dry season. This BMP would minimize erosion that would result from hauling actions.

Hauling and road maintenance would occur on multiple roads within the Rattlesnake road system during biomass removal for the Rueben Fuels project. This project would also utilize BMPs and PDFs that would protect from excessive erosion and would minimize offsite erosion.

Erosion from the combined hauling actions of the Rattlesnake restoration project Rueben Fuels Project, and the proposed Fire Resiliency Project would be consistent with, and within the magnitude of, the impacts that were discussed for hauling in the direct and indirect impacts of Alternative 2, and would be consistent with the analysis and conclusions provided in the1994 Medford RMP EIS . Sedimentation resulting from these actions is discussed further in Section

3.4, Cumulative Impacts to Water Quality. There are no overlapping actions from any federal or non-federal projects that would occur within the proposed treatment units.

3.4 Water Quality: Stream Sedimentation

3.4.1 Affected Environment Water Quality: Stream Sedimentation

In this analysis, the sub-watershed scale or smaller is used to better detect potential effects of the project near the site of proposed actions. The rationale is that adverse (or beneficial) effects to water resources are easier to detect in smaller catchments (Bosch and Hewlett 1982) and as one nears the treatment site. Table 1 shows the location of the project by sub-watershed. These four sub-watersheds comprise the overall analysis area for water resources.

Sediment input to stream channels is a result of both natural and management related processes. Primary sediment sources include: episodic landslides and slumps usually associated with intense winter storms, hillslope erosion, stream bank erosion and roads. Forest management related increases in sedimentation are most often the result of poorly designed and/or poorly maintained forest roads. These roads can be a major contributor of fine sediment to streams (Reid and Dunne 1984).

There are no streams in the Planning Area currently listed by ODEQ as impaired by excess fine sediment. As discussed above in Section 3.3 Soil Erosion and Sensitive Soils, the only actions associated with this project that would result in offsite erosion that could lead to stream sedimentation is road maintenance and haul. Some roads in the Planning Area show evidence of surface erosion, inadequate drainage, inadequate stream crossings or unstable cut-banks and fill slopes. Where hydrologically connected these roads are likely to provide excess fine sediment to adjacent streams. Field inspections of the proposed haul route showed multiple locations with the potential for accelerated sediment delivery. Roads contribute to stream sedimentation at different levels depending on the depth and quality of rock, type of use, location, maintenance frequency, and moisture levels of the road surface during use. BLM managed land in the Glendale Resource Area limits its use of rocked and natural surface roads to dry conditions to reduce erosion and protect road surface integrity. Approximately 55% of proposed haul roads are hydrologically connected to streams. There are a total of 46 stream intermittent and perennial stream crossings along the proposed haul route. Approximately 91% of these cross first and second order headwater streams.

Designated beneficial uses for the Middle Cow Creek watershed include; public and private domestic water supply; industrial water supply; irrigation; livestock watering; anadromous fish passage, rearing, and spawning; resident fish and aquatic life; wildlife and hunting; fishing; boating; water contact recreation; and hydropower. Beneficial uses within the Lower Cow Creek watershed include domestic and industrial water supply, irrigation, livestock watering, anadromous fish passage, salmonid fish rearing and spawning, resident fish and aquatic life, wildlife, hunting, fishing, boating, water contact recreation, aesthetic quality, and hydroelectric power.

The Oregon Department of Environmental Quality (ODEQ) is responsible for establishing water quality standards to protect beneficial uses and aquatic life in Oregon streams. Currently ODEQ does not have established criteria for measuring sediment. The current water quality standards instead address turbidity, a measure of water clarity. These standards are primarily based on an Environmental Protection Agency (EPA) recommendation from 1976. ODEQ is in the process of revising the water quality standards for turbidity based on the best available science regarding the effects of turbidity on beneficial uses, in particular aquatic life (http://www.deq.state.or.us). This standard does not necessarily correlate with the amount of sediment entering the stream.

Stream surveys completed in the Fire Resiliency Planning Area indicate that though variable, water quality, channel stability, and stream bed quality for aquatics within, and adjacent to units is generally in good condition. Within less than 10% of the streams surveyed, one or more of these was rated as poor. Skid trails and roads that are crossing or adjacent to streams were reported to be the primary cause.

3.4.2 Alternative 1 (No Action) Effects to Water Quality: Stream Sedimentation

Sedimentation from harvest actions across all ownerships within these sub-watersheds would be expected to remain consistent with current levels over the long term, but may vary from year to year. Currently, road density within these sub-watersheds is 3.35 mi/mi^2. For this element, this is slightly above the 3 mi/mi^2 threshold for "not properly functioning" for aquatic species by the National Marine Fisheries Service (NMFS) (USFWS/NOAA Fisheries Table of Population and Habitat Indicators, USDA et al. 2004b). Though some new roads would be constructed outside currently proposed federal actions, sediment from roads is likely to remain at current levels or may even decrease in the future since road design and construction practices provide for greater consideration of water quality and aquatic resources than the practices used when legacy roads were constructed. Older legacy roads in poor locations, or that were poorly constructed would likely continue to be decommissioned and rerouted, or upgraded in the future as projects and funding occurs.

Under Alternative 1, erosion and stream sedimentation would occur in conjunction with scheduled and emergency road maintenance activities under the Medford Road Maintenance Categorical Exclusion. These actions would be limited to within the road right of way and would be done using BMP's to protect from offsite erosion and ensure compliance with Oregon water quality standards for turbidity. These are ongoing actions on Medford BLM lands, and have been further refined to reduce the instances and magnitude of offsite, excessive erosion, or stream sedimentation. These actions would therefore be expected to maintain or reduce current erosion levels from road maintenance in the future.

The Rueben Fuels Project includes 57.3 miles of existing road maintenance and haul. Approximately 37.0 miles of these are rocked roads that are hydrologically connected to streams within the Rueben Project Planning Area. This project will occur within four HUC 6 sub-watersheds. Of these, Dads Creek-Cow Creek and McCullough Creek Cow Creek overlap the Rattlesnake portion of the Planning Area. Reuben Fuels was analyzed under the Revised Reuben Hazardous Fuel Reduction Project Environmental Assessment (Oct, 2010). This analysis

showed that road maintenance and haul would result in low levels of erosion that would remain onsite, except where roads run in close proximity to streams and at stream crossings. Analysis for this project concluded that hauling and road maintenance activities would not be of a magnitude to result in a visible increase in stream turbidity during hauling activities, or a measurable increase in the overall stream sediment deposition for more than 25 feet downstream within any stream channels. This would be consistent with the State of Oregon water quality standards and would not result in any measurable effects on macroinvertebrates communities or aquatic habitat.

There is one restoration project that will be occurring within these sub-watersheds. The Middle Cow Creek Restoration project proposed actions that will improve habitat complexity, water quality, and fish passage through placement of instream structure (logs and boulders). It will also improve riparian habitat by removing invasive weed species that are widespread along the streams and replanting these areas with native trees and shrubs that will provide future large woody debris. Roads within the Planning Area that are having a direct input of sediment into streams will be targeted for corrective actions including maintenance, renovation, and decommissioning as funding allows. Locations for many of these actions have not yet been decided. Currently the only confirmed activity associated with the Middle Cow Creek Restoration within these sub-watersheds is the instream log placement that will occur on Rattlesnake Creek. This action will place logs instream in 25-30 locations along an approximately ¾ mile reach of Rattlesnake Creek, upstream of Stevens Creek. Logs will be trucked in from an offsite location and will be yarded into the stream using ground based equipment. The effects of this project were analyzed in the Aquatic and Riparian Habitat Enhancement EA. Sediment depositions and turbidity from hauling, use of equipment, and bank and channel disturbance from yarding and anchor points would be short term. Project duration, in almost all cases would be less than 2 weeks. Inputs of fine sediment would typically be limited to the time of activity. It is expected that any introduced fine sediment would become entrained in the first high flow of the season and would become a small, immeasurable percentage of the stream channels sediment load. After which, sediment would not affect downstream gravels or pool volume. Similarly, any increases in turbidity would cease upon completion of instream equipment operation. The expected long term benefits are improved channel complexity, aquatic connectivity, and bank stabilization to aquatic habitat and species.

Water Quality impacts that will result from all federal projects discussed above are consistent with the Clean Water Act and the impact analysis and conclusions provided in the1994 Medford RMP EIS.

3.4.3 Alternative 2 Effects to Water Quality: Stream Sedimentation

Roads: Haul Activities and Road Maintenance

There are 17 miles of existing road and 2.2 miles of new temporary routes that are proposed for haul and maintenance. All natural surface roads are hydrologically disconnected from streams. There are 11.7 miles of existing rocked roads that are hydrologically connected to streams via stream crossings and close proximity. These roads would receive road surface and ditchline maintenance as necessary to protect the integrity and drainage of the road before, during, and/or

following use. Because the lower portions of all access routes to treatment units are hydrologically connected, hauling would be restricted to the dry conditions on all roads.

Portions of five haul roads in this analysis are hydrologically connected to streams. These are County RD 28, and forest roads 32-5-18, 33-7-2.1, 33-7-2.2, and 33-7-11. . The hydrologically connected portions of these roads that run parallel to creeks have sufficient rock to provide surface protection and would result in minimal amounts of erosion during dry condition hauling actions. Given the condition and degree of adjacent slopes, vegetation along streams would be adequate to capture most erosion from this road use, except at stream crossings.

Best Management Practices and Project Design Features for road related activities would reduce and in some cases eliminate sediment from entering stream channels. Sediment derived from road maintenance would be primarily directed to ditch lines and then out of the ditchlines via ditch relief culverts. Where roads are connected to streams, sediment would enter stream channels. Well vegetated ditchlines would further reduce the amount of sediment reaching stream channels. Sediment control devices would be installed in some instances to trap and store sediment which would further reduce sediment delivered to streams.

During the dry condition haul there is no water flowing on the road surface or in ditchlines, so sediment delivery to streams would be minimal. Sediment generated from haul roads could move off-site during winter rains. The amount of sediment which would reach stream from haul and maintenance actions would not result in visible turbidity during use, and would be indiscernible from background levels that would be typically seen during early season storms. Deposition of fine sediments could result at capture points within 25 feet, downstream of stream crossingswithin smaller tributaries. The extent of these deposits would not be of a magnitude to alter macroinvertebrate populations and would be indiscernible following the first few rains. Effects to water quality from hauling and road maintenance would not be discernable from background levels within any major streams 3rd order or higher within this Planning Area.

Project Design Features, BMPs, adequately surfaced roads, and vegetated ditchlines would reduce if not eliminate sediment transport to stream channels. Road maintenance completed prior to and after haul would further reduce the amount of off-site sediment movement during and after haul. Sediment derived from hauling would be primarily directed to ditch lines and then out of ditchlines via ditch relief culverts to the forest floor. Sediment directed to hillsides by ditch-relief culverts would filter into the soil before reaching stream channels.

The amount of fine sediment introduced to streams during haul activities would be indiscernible beyond natural erosion processes occurring during winter rains and would have negligible impacts to downstream resources. The use of these roads is expected to be short term and limited by weather conditions as specified in the site specific project design features. Sediment reaching stream channels as a result of road activities would not cause a visible increase in stream turbidity or a reduction in macroinvertebrate populations. Changes in embeddedness, interstitial spaces, and pool depth would not occur. A long-term reduction in sediment entering streams would occur on some sections of haul road following road maintenance because these road activities would improve currently impaired road drainage. These actions would therefore not exceed State of Oregon water quality standards and would not result in any measurable

effects on aquatic habitat. Alternative 2 is also consistent with the standards and guidelines set forth under the 1994 Medford RMP EIS.

Cumulative Effects

Cumulative effects of past land management practices on federal and non-federal lands have contributed to the current reductions in water quality and aquatic habitat within the analysis area. Sedimentation from harvest actions and road construction on non-federal lands within these sub-watersheds would be expected to remain consistent with current levels over the long term, but may vary from year to year. These projects would be expected to be consistent with the Oregon Forest Practices Act, the Clean Water Act and the Endangered Species Act. These acts provide a threshold for water quality and aquatic impact that would suggest that actions affecting water quality and aquatic habitat on non-federal lands would maintain current conditions.

Areas of short-term localized sediment input would occur as a result of proposed road maintenance and hauling activities associated with federal harvest projects in these sub-watersheds. One Aquatic restoration project would additionally result in increased sediment within Rattlesnake Creek for approximately 2 weeks following the completion of the instream activity. Since these impacts would be short term and localized, and would be indiscernible from background levels outside the affected reach, or following the first rains of the season or sooner within the affected reach, these impacts would not contribute to a cumulative long term reduction in water quality or aquatic habitat. Long-term sediment reductions due to the proposed road work would improve localized stream conditions and benefit aquatic habitat within the analysis area at a site specific scale. Aquatic restoration projects would further improve water quality and aquatic habitat in the long term.

Erosion and stream sedimentation from the combined hauling and road maintenance actions for the Rattlesnake restoration project, Rueben Fuels project, and the proposed Fire Resiliency project would be consistent with, and within the magnitude of, the impacts that were discussed for hauling and road maintenance in the direct and indirect impacts of Alternative 2. Stream sedimentation from these actions would not be discernable beyond 25 feet of road crossings in small tributary streams, or following the first rains following the action. Within 3rd order or larger streams stream sediment resulting from hauling and road maintenance actions would not be discernable from background levels at all due to the fine sediment entrainment that would occur in these higher streamflows. Since non-federal haul would be expected to continue at current rates and would be expected to maintain current conditions, all actions would cumulatively maintain current conditions at the sub-watershed scale or larger.

Given the magnitude, dispersed locations, extent, and short term nature of each of the water quality impacts that would occur during these projects, having multiple projects occur within the same watershed during the same time period would not cumulatively change the magnitude of impacts, or the extent that was analyzed for the direct and indirect effects of each individual project. Logically it can be concluded that negligible increases in sediment from these activities would contribute to the overall amount of sediment entering streams from past, present, and future impacts within these sub-watersheds, but sediment from these actions would be within ODEQ water quality standards, the Clean Water Act, and is within the scope of anticipated effects to aquatic resources analyzed in the Medford District PRMP EIS (USDI 1994).

3.5 Soil Compaction and Productivity

3.5.1 Affected Environment for Soil Compaction and Productivity

Physical, chemical, and biological properties of soils determine the natural level of productivity of a soil. These properties also determine how different soils will respond to natural and anthropogenic disturbances. For soils to be productive for timber management, soils must be able to acquire, maintain, and release water and nutrients needed by trees during the growing season. Soils also must be able to support the microorganisms necessary to maintain proper nutrient cycling and plant nutrition. Forest management activities can affect these soil properties by compacting and displacing soils and removing topsoil organics.

Soil compaction is defined as the packing together of soil particles by physical pressure at the soil surface that results in an increase in soil density and a decrease in pore space. A decrease in soil pore space results in restricted movement of water, nutrients, air, and plant roots, and as such generally decreases site productivity in most soil types.

Soil productivity, in a forested setting, is primarily the soil's capacity to support plant growth over time as reflected by some index of biomass accumulation. Losing a soil's plant growth capacity means losing the site's ability to sustain timber production at an expected level as well as the loss of other important ecological values. Soil productivity is affected by soil bulk compaction, soil displacement, and by changes and reductions in soil nutrients. Litter, humus, soil wood, and other key properties of the surface mineral layers of forest soils are most easily and commonly disturbed by yarding activities, yet they are crucial to forest productivity. Minimizing the amount of soil displacement, compaction, and topsoil loss will generally maintain stand development. The most common types of disturbances effecting soils and associated long term soil productivity are displacement and compaction. Soil compaction and displacement, which affect growth, is a combined effect.

Soil productivity losses are calculated by multiplying acres of compaction/displacement times a 35% productivity loss factor *(*Productivity losses of 30 and 40% for disturbed and compacted acres respectively, are based on the Medford District PRMP vol.3 calculations, p.18-20. The two productivity loss factors were averaged at 35% based on estimated percentages of compaction and displacement within each cable yarding corridor and tractor skid trail to be equal proportions*.) This product is then divided by the number of harvest acres and then multiplied by 100% to determine the percent reduction in productivity. The calculations take into account compaction/displacement associated with temporary routes, landings, skid trails, and cable yarding corridors.

3.5.2 Environmental Consequences Soil Compaction and Productivity

3.5.2.1 Alternative 1 (No Action) - Effects on Soil Compaction and Productivity

Alternative 1 would result in a negligible increase in soil productivity. Unrecovered compaction/displacement that resulted from past activities within nine of the fourteen treatment

units proposed for the Fire Resiliency Project would continue to regress in time to pre-harvest/entry conditions. Fine roots of current vegetation would continue to loosen compacted soil. Leaf fall and other litter from the vegetation would continue to add organic material to the soil. Soil productivity in areas not affected by past disturbance would continue along existing productivity patterns.

3.5.2.2 Alternative 2 Effects on Soil Compaction and Productivity

Alternative 2 proposes 432 acres of density management that would result in an estimated 42.8 acres of soil compaction and displacement over new and existing footprints and would reduce soil productivity by an estimated 3.5%. Best Management Practices in the 1995 RMP (p. 166) describe the use of designated skid roads within stands to limit soil compaction to less than 12% of the harvest area. The analysis of skid trail compaction/displacement that was projected in GIS averaged approximately 1.2% compaction per density management unit. Total compaction/ displacement associated with new and existing temporary routes, tractor skid trails, landings and cable yarding corridors would account for an average of approximately 9.9% per unit. The Fire Resiliency Project would be below 12% compaction and 5% productivity loss as analyzed in the 1994 Medford District FEIS RMP. Each proposed density management unit would be below 12% compaction and 5% productivity loss.

The specific actions of the Proposed Action that would affect the physical, chemical, or biological properties of soils in proposed harvest units are described below.

Soil Compaction/displacement

Roads
A total of up to 1.51 miles of temporary route construction are anticipated to occur under Alternative 2. These routes would allow harvest operations to occur within parts of units 1-3L, 11-1L, and 6-1R. These temporary routes would amount to approximately 2.6 acres. Following use, these temporary routes would be ripped, stabilized, water barred and barricaded. There would be some short-term loss of soil productivity where the temporary route was constructed due to displacement of soil organics. There would be an increase in soil productivity within the unit along these temporary routes in areas where the organics were deposited (e.g. fill-slopes). Ripping of these temporary routes would mitigate compaction.

A total of up to 0.65 miles of road temporary route reconstruction would occur within units1-3L, 11-1L, 6-1R, and 11-2R. These routes utilize existing road footprints that are currently compacted as a result of past management activities. Some of this reconstruction would consist of blading an existing road footprint. These existing routes that would be re-opened under Alternative 2 amount to approximately 1.1 acres. Following use, these reconstructed routes would be ripped, stabilized, water barred and barricaded. While some displacement of surface organic material that had fallen onto the old road surface would occur, compaction would be reduced by the ripping. Overall, soil productivity on these acres would improve.

- ***Landings, Skid trails, and Cable Yarding Corridors***
  Unmitigated soil compaction from landings, skid trails, and cable yarding corridors would occur on approximately 41.9 acres (an additional estimated 0.9 acres would result from temp route

construction) as a result of Alternative 2. These landings, skid trails, and yarding corridors would be utilized during the extraction of commercial size timber and biomass.

Landings, skid trails, and cable yarding corridors would be winterized and rehabilitated by properly installing and/or using water bars, berms, sediment basins, gravel pads, hay bales, small dense woody debris, seeding and/or mulching, to reduce sediment runoff. Tractor landings would be ripped after use to mitigate compaction.

Operators working within previously harvested units would be required to utilize existing skid trails to the greatest extent possible before consideration of new trails. New skid trials, would be pre-designated and approved by the BLM Authorized Officer.

- ***Use of Mechanized Harvest equipment off of designated skid trails***
  Harvest equipment used off of designated skid trails would operate on ground less than 35% slope, on slash mats when possible and minimize turning. Slash mats would disperse downward pressure across the soil surface. In addition, to prevent operations from exceeding the maximum 5% soil productivity loss, equipment use may be restricted.

Soil Productivity
In many of the units proposed for treatment under Alternative 2, reduction of stand densities, either through density management treatments or understory thinning, would increase the productivity of residual trees by effectively increasing water, light, and nutrient availability. In the remaining units, thinning would improve/maintain stand vigor and current growth rates. The stands in the Planning Area are a product of past timber management activities, passive management and fire suppression. Many of these stands are currently showing reduced growth rates as a result of overstocked conditions that are causing competition for soil nutrients and water.

3.5.2.3 Cumulative Effects of Alternative 2 on Soil Compaction and Productivity

The effects of the proposed action were analyzed on the project and on a per harvest unit basis. The design of Alternative 2 to meet established standards for loss of soil productivity in this project as in others maintains desired soil productivity on BLM managed lands across the landscape.

3.6 Fire Hazard

Background Information on Fire Hazard

The Fire Resiliency Planning Area is within the Klamath Province Region in southwestern Oregon where fire is recognized as a key natural disturbance (Atzet and Wheeler 1982). Fire has played an important role in influencing ecosystems processes and creating diverse forest conditions in southwestern Oregon. Fire resiliency is the ability of an ecosystem to resist and recover from disturbances as it related to large-scale, high-severity wildland fire.

Prior to the 20th century, low severity fires burned regularly in most dry forest ecosystems, with ignitions caused by both lightning and humans. Low severity fire moderated the regeneration of fire intolerant species, promoted fire tolerant species regeneration, such as ponderosa pine and Douglas-fir, maintained an open forest structure, reduced forest biomass, decreased the impacts of insects and diseases, and maintained wildlife habitats for many species that utilize open stand structures (Graham et al. 2004). Native Americans influenced vegetation patterns for over a thousand years by igniting fires to enhance values that were important to their culture (Pullen 1995). Early settlers used fire to improve grazing and farming and to expose rock and soil for mining. Based on fire scars and vegetative patterns, large, low to moderate severity fires were a common occurrence in the area.

Prior to Euro-American settlement, fires ranged in size from less than an acre to over 20,000 acres in area within similar fire regimes (USDI 2005). Frequent fires that historically served as thinning mechanisms by naturally regulating stand densities were effectively being excluded from ecosystems by the 1940s (Graham, 2004). Information from the Oregon Department of Forestry database shows a total of 315 fires occurred in the Middle Cow watershed between 1967 and 2009. Seventy one fires out of the 315 wildfires occurred on BLM-administered lands, 244 fires (77 percent) occurred on private lands (other ownership). Ninety six percent of the fires were held to 10 acres or less and 100% were limited to less than 1,000 acres. The limited size of recent fires, due to aggressive fire suppression efforts, illustrates the interruption of the natural fire regime.

Table 2 Fire History in the Middle Cow 5th Field Watersheds between 1967 -2009.

	Size Classes - Natural Caused Fires							Size Classes – Human-Caused Fires						
Ownership	A	B	C	D	E	F	G	A	B	C	D	E	F	G
BLM	38	13						13	4	3				
Private	35	10	2					125	55	5		1		
State	6	2						1	1	1				

Data derived from Oregon Department of Forestry database from 1967 to 2009.

Size Class A = Less than 1 acre
Size Class B = 1 to 9 acres
Size Class C = 10 to 99 acres
Size Class D = 100 to 299 acres
Size Class E = 300 – 999 acres
Size Class F = 1,000 to 4,999
Size Class G = Greater than 5,000 acres

In the early 1900s, suppression of all fires became a goal of land management agencies. Fire exclusion has altered the fire return interval (frequency) and severity (intensity) from what would take place under the historic fire regime. Based on calculations using fire return intervals, two to five fire cycles have been missed in the southwest Oregon low elevations mixed conifer forests (Thomas and Agee 1986). As a result of the exclusion of fire, natural levels of vegetation have shifted towards overstocked stands, with an increase in the number of suppressed tree and shrub species. There has also been a shift from species that are more suited to open growing conditions (pine) to species that are tolerant of shade conditions (Douglas-fir). This dense vegetation serves as surface and ladder fuel that can increase fire intensity and potential for large scale stand-replacing fires that were once historically rare.

3.6.1 Affected Environment for Fire Hazard

Fire Regimes

Fire regimes refer to a general classification of the role fire would play across a landscape naturally, meaning in the absence of modern human intervention, but including the influence of aboriginal burning (Agee 1993, Brown 1995). Coarse scale definitions for natural (historical) fire regimes have been developed by Hardy et al. (2001) and Schmidt et al. (2002) and interpreted for fire and fuels management by Hann and Bunnell (2001). The fire regimes are classified based on fire return interval and fire severity. Fire severity is the measure of the amount of damage, or mortality. Lower fire severity means that a fire burns through the forest but stays on the ground without resulting in a drastic amount of mortality (less than 25% of the dominant overstory vegetation). High fire severity means that the fire burns hot enough to cause major mortality to the forest by burning through the crowns of the trees (over 75% of the dominant overstory vegetation).

Table 3. Fire Regime, Fire Return Interval (frequency), Fire Severity (intensity) and Acres within the Windy Creek, McCullough Creek-Cow Creek and Dads Creek-Cow Creek 6th Field Watershed.

Fire Regime	Fire Frequency	Fire Severity	Acres
I	0-35 years	Low to mixed severity, surface fires	39,712
II	0-35 years	High severity, stand-replacement fires	687
III	35-200 years	Mixed severity, surface to stand-replacement fires	4,818
IV	35-200 years	High severity, stand-replacement fires	81
V	200+ years	High severity, stand-replacement	---

Data derived from Landfire National Vegetation Dynamics Models http://www.landfire.gov/index.php

Fire Regime I. 0-35 years, High Frequency/Low Severity
Plant communities include dry Douglas-fir sites found on all aspects. Surface fires are the norm with large, high severity fires rarely occurring (i.e. every 200 years). Approximately 93% (13,612 acres) of BLM land in the Planning Area is within this fire regime.

Fire Regime II. 0-35 years, High Frequency/High Severity
Plant communities include ceanothus and Oregon chaparral. Typical fire return intervals are 10-25 years. High fire severity occurs due to the presence of brushy vegetation. Approximately 1% (218 acres) of BLM land in the Planning Area is within this fire regime.

Fire Regime III. 35-200 years, Moderate Frequency/Mixed Severity
Plant communities include mixed conifer and Douglas-fir sites. Fire severity is mixed with large, high severity fires occurring rarely (i.e. every 200 years). This fire regime exhibits fire behavior that results in mosaic patterns on the landscape with burned and unburned patches. Approximately 6% (846 acres) of BLM land in the Planning Area is within this fire regime.

Fire Regime IV. 35-200 years, Low Frequency/High Severity
Plant communities include mixed conifers and Douglas-fir / Western hemlock. High fire severity with stand replacement fires that reset large landscapes occurring every 200 plus years.

Less than 1% (1 acre) of the BLM land in the Planning Area is within this fire regime.

The natural fire regimes in the Planning Area indicate that the landscape experienced fires frequently, less than every 35 years in 89% of the area. Aggressive fire suppression efforts since the 1940s have interrupted this natural fire regime, shifting the Planning Area into condition classes 2 and 3.

Fire Regime Condition Class

The shift in vegetative patterns resulting from the exclusion of natural fire occurrences are measured in terms of Fire regime Condition Class (FRCC). FRCCs are a function of the degree of departure from the natural, or historic, range of variability (Hann and Bunnell 2001). This measure involves two pieces of information: (1) historic fire regime, and (2) the condition class. These departures result in changes to the forest structure such as alterations of species composition, structural stage, stand age, and canopy closure. Coarse-scale FRCC classes have been defined and mapped by Hardy et al. (2001) and Schmidt et al. (2002) (FRCC). They include three condition classes for each fire regime. The classification is based on a relative measure describing the degree of departure from the historical natural fire regime.

> *Condition Class 1* = Fire frequencies are within or near the historical range, and have departed from natural frequencies by no more than one return interval. The risk of losing key ecosystem components is low. Vegetation species composition and structure are intact and functioning within the historical range for the area.
>
> *Condition Class 2* = Fire frequencies and vegetation attributes have been moderately altered from the historical range, and fire frequencies have departed from natural frequencies by more than one return interval. This change results in moderate changes to one or more of the following: fire size, frequency, intensity, severity, or landscape patterns.
>
> *Condition Class 3* = Fire frequencies and vegetation attributes have been significantly altered from the historical range, and fire frequencies have departed from natural frequencies by multiple return intervals. The risk of losing key ecosystem components is high. This change results in increases to fire size, frequency, severity, and landscape patterns.

Table 4. Current Fire Regime Condition Classes by Fire Regime on BLM-Administered Lands for Windy Creek, McCullough Creek – Cow Creek and Dads Creek – Cow Creek 6th Field Watersheds.

Fire Regime	FRCC 1		FRCC 2		FRCC 3	
	Acres	Percent	Acres	Percent	Acres	Percent
I	3,787	28	6,478	48	3,347	24
II	41	19	153	70	24	11
III	209	25	312	37	325	38
IV	---	---	1	100	---	---
V	---	---	---	---	---	---
Total	4,037		6,944		3,696	

Data derived from Landfire National Vegetation Dynamics Models http://www.landfire.gov/index.php

Fire Hazard

Fire behavior, particularly flame length, is critical in the selection of fire suppression strategies. Typically flame lengths less than four feet can generally be managed by fire suppression personnel using direct attack on the fire edge. Flame lengths greater than four feet generally require firefighting equipment and utilize an indirect attack strategy, where personnel back off to a defensible position away from the fires edge, flame length serves as the threshold used for this analysis. Crown fire activity, particularly in mixed conifer type forest systems, has been a paramount concern in southwest Oregon, due to the threat to life and property from large-scale unpredictable spread events, the difficulties presented to fire control efforts, and the severity of fire effects.

Fire hazard ratings were developed for Windy Creek, McCullough Creek-Cow Creek and Dads Creek-Cow Creek 6th Field Watersheds utilizing data from the Douglas County Risk Assessment (Gnauck, et al. 2008). These hazard ratings were based on the predicted potential for crown fire, fire rate of spread, and flame lengths. An estimated 69% of the area rate as high hazard, 18% rate as a moderate hazard, and 13% low hazard. The high and moderate hazard acres account for 87% of the Planning Area.

Fire hazard is a fuel complex, defined by volume, type condition, arrangement, and location, that determines the degree of ease of ignition and of resistance to control. This fuel complex determines the ability of fire spread once ignition has occurred. Changes in forest structure effect fire hazard because of an increase or decrease in the amount of surface, ladder, and aerial (or crown) fuels.

> ***Surface Fuels***: Loose litter on the soil surface, normally consisting of fallen leaves or needles, twigs, bark, cones, and small branches that have not yet decayed enough to lose their identity; also grasses, forbs, low and medium shrubs, tree seedlings, stumps, downed branches, and downed logs (NIFC-B, 2006).
>
> ***Activity Fuels (slash)***: Vegetative material lying on the forest floor that is created during implementation treatment activities such as broken tree tops and severed branches that become increasingly flammable as they cure and turn into "red slash."
>
> ***Ladder Fuels***: Material that provides vertical continuity between surface fuels and aerial fuels. Ladder fuels may include tall grasses and low lying limbs of trees, along with bushes, shrubs, and small trees that make up the understory of a forested stand (NIFC-B, 2006).
>
> ***Aerial Fuels***: Vegetation in the forest canopy, including tree branches, twigs and cones, snags, moss, and high brush (NIFC-B, 2006).

Fire behavior, in the context of wildland fire, is dictated by fuel, weather, and topography. There are several types of fire behavior, categorized by fuels that sustain the flame:

Surface fires burn on the surface of the ground and consume surface fuels. The fire stays on the ground.

Passive crown fires, also referred to as "torching," occur when the fire burns up through the ladder fuels and into the crown of an individual tree or small groups of trees. The fire is sustained by the surface fuels but a solid flame is not consistently maintained in the canopy of the stand of trees.

Active crown fires burn from the surface fuels, up through the ladder fuels, and into the aerial fuels enabling a solid flame to be consistently maintained in the canopy of the stand of trees.

Crown Bulk Density (CBD) and Crown Base Height (CBH) are parameters which are important components of overall fire hazard.

CBD is the mass of available canopy fuel per unit canopy volume. It is evaluated at the stand level, not an individual tree. The CBH is the average distance (height) from the ground level to the lower branches of the trees that form the main forest canopy where there is sufficient crown loading in needle and 1hr fuels for a certain level of surface fire intensity to transition into the crown (0.011 kg/m3) (Rebain 2010, Reinhardt and Crookston 2003). Potential crown fire activity is assessed based on the relationship of surface fuels (fuel model), average height from the surface fuel to the lowest crowns of the trees (CBH), and the volume of crown fuel present across the upper strata of the vertical fuel layer (CBD).

Fuel Models

Fire behavior fuel models are a way to describe the surface fuel complex. These fire behavior fuel models are also used to predict the potential behavior and effects of wildland fire (Scott & Burgan 2005). The majority of the Planning Area can be identified within the timber understory (TU) and the timber litter (TL) fuel models identified in Table 5.

Table 5. Fire Behavior Fuel Models with the associated Flame Lengths during fire season weather conditions given a 5 mph wind.

Fire Behavior Fuel Model	Fuels Model Group	Flame Length (in feet)
TL3	Timber Litter	1-2
TU2	Timber Understory	3-5
TU5	Timber Understory	7-9
SB1	Slash/Blowdown	2-4
SB2	Slash/Blowdown	5-8

(Scott, Joe and Robert Burgan 2005. USDA, GTR-153)

3.6.2 Environmental Consequences Fire Hazard

The objective of the proposed Understory Thinning and Density Management Thinning treatments is to restore ecosystems to within their natural range of variability by implementing thinning activities and reintroducing fire. These treatments are considered as having long term beneficial effects decades into the future by setting forested stands on a trajectory towards larger, more fire resilient trees that are able to withstand wildfire events with a minimized amount of mortality to the forest. One method of evaluating treatment effectiveness is through modeling the change in stand conditions and characteristics.

Modeling Assumptions and Methods

Although there are many limitations to the predictions resulting from models, comparing predicted current fire conditions (no action) with post treatment conditions can help illustrate the relative effectiveness between alternatives in attaining fire resiliency. Models, used as one tool, can provide insight into complex systems, and can also serve as one source of information for decision making.

The environmental consequences assessment for the Glendale Fire Resiliency Project included data from 20 plots distributed across the entire Glendale Resource Area representative of typically occurring mixed conifer and hardwood stands with dense understory vegetation and suppressed trees. The data collected at these plots followed methods outlined in the FIREMON protocols (Lutes, et al. 2006) for Fuel Loading (FL) and Tree Data (TD).

Plot data was used to analyze the expected alterations of the Proposed Action to the fuel complex and potential fire types, discussed in the affected environment. Fire behavior modeling was simulated under mid-late summer and early fall conditions which enhance the likelihood of intense fire behavior (90th percentile conditions). The 90th percentile weather conditions are defined as the combination of temperature, humidity, wind, and fuel moisture that is warmer, drier, and windier than 90% of all summer days. Under 90th percentile weather conditions, 10% of the summer days are assumed to be hotter, drier, and windier. For example: the fire season is described as the 153-day period between May 1 and September 30th. Ten percent (or 15 days)

would be hotter, drier, and windier than the conditions described as 90th percentile. Weather data used in the fire type analysis was compiled from the Calvert remote automated weather station (RAWS) from May 1th through October 31th for 2000 – 2009. The daily weather records were analyzed for dryness (precipitation), environmental conditions which would support a flame length greater than 4' (potential fireline intensity), and wind speeds. The modeling analysis was performed with the Forest Vegetation Simulator (FVS), a forest growth model, and Fire and Fuels Extension (FFE), a non-spatial fire behavior and fuel processor, for the Proposed Action (Rebain 2010, Reinhardt and Crookston 2003, Stage 1972).

Direct effects refer to consequences caused by the activities or events themselves, occurring concurrently and in the same location. Treatments directly alter the components comprising the hazardous fuel complex discussed in the affected environment.

Indirect effects include consequences, occurring later in time or are farther removed in distance from the point of contact, but are still reasonably foreseeable. Treatments indirectly affect potential fire behavior, the Fire Regime Condition Class and Fire resiliency of stands.

3.6.2.1 Alternative 1 (No Action) Effects to Fire Hazard

The No Action Alternative would allow conditions that support a high potential for large, high intensity fires to continue. Fuel hazard would increase as vegetation continues to develop on current successional trajectories. Crown base height would decrease due to understory density increases, increasing the potential for crown fire initiation. There would be no reduction in crown bulk density and crown base height, thus there would be the potential for a high-severity wildland fire.

As a result of not implementing the proposed action there would be no short term increase (six months – 3 years) in fire hazard from activity fuel (slash) in the Planning Area. No hand piles, landing piles or activity slash would occur within the Planning Area.

Direct Effects-Fire Hazard

Understory Thinning
Under Alternative 1, surface and ladder fuels would continue to increase in understory density, increasing the potential for crown fire initiation, increasing the potential in high severity, stand-replacement fires. Current conditions are such that the crown base height is lower than the predicted surface flame length for a late summer wildfire (Table 6). Regardless of surface wind speeds, the surface fuel model intensity and the crown base height would allow a surface fire to travel into the canopy, or aerial fuels.

Density Management Thinning
Under Alternative 1, there would be no reduction crown bulk density and therefore, the potential for high severity, stand-replacement fires would remain the same as it currently exists. The crown bulk density under the No Action Alternative is great enough to support passive and active crown fire, depending on the wind speeds (Table 7). With these conditions, wildland fire fighters and the local public would be at greater risk of loss of life and property. Direct attack capabilities would diminish as fuel hazard would continue to increase. Initial attack success

would continue to decline resulting in larger fire sizes. Aerial attack effectiveness would decrease with extreme fire behavior and, as upper and mid-level canopies continue to close, penetration of aerial applications of water or retardant would be reduced. As a result, in the event of a wildfire, many stands could experience stand replacing wildfires.

Table 6. The predicted direct effects of the No Action Alternative to characteristics of the Fuel Complex (Flame Height, Crown Base Height, and Crown Bulk Density) based on plot data from representative stands.

	Avg. CBH (ft)	Avg. CBD (kg/m3)	Flame Height (ft)	Surface Fire Behavior Fuel Model
No Action Alternative	4	0.204	7	TU5/SB1

Indirect Effects-Fire Hazard

Understory Thinning and Density Management Thinning

If the No Action Alternative is selected, long term beneficial effects would not occur in terms of increases in fire resiliency because the trend of conditions producing a high potential for large, high severity fires would continue. Fire severity would increase as surface and ladder fuels continue to develop in the understory from the continued exclusion of fire and the lack of active fire resiliency treatments. The potential for high severity, stand-replacement wildland fires would continue to increase throughout the Planning Area.

Areas currently identified as being in Condition Classes that are within the natural range of variability would continue to transition into Condition Classes that are increasingly departed from their natural range. These transitions would exacerbate fire behavior and fire severity, increasing the risk of losing key ecosystem components such as natural resources and wildlife habitat.

The weather analysis indicated that 34% of days in the last 100 of the fire season exhibited environmental conditions that would only support a surface fire. Thus 34% of days in the latter portion of the fire season exhibited no potential for crown fire activity due to the environmental conditions (Table 7). For the remaining days, passive crown fire was predicted 9% of the time, while active crown fire was predicted for 57% of the period of analysis, under the No Action Alternative. The associated average stand mortality was predicted at 97%.

Table 7. Wind speed frequency, predicted stand mortality and fire type for the late summer and early fall fire season for representative stands under the No Action Alternative.

		90th Percentile Fire Behavior Analysis May01-Oct31 (2000-2009)												
RAWS Calvert (3822 elev)	Wind Speed (mph)	surf	1-2.9	3-4.9	5-6.9	7-8.9	9-10.9	11-12.9	13-14.9	15-16.9	17-18.9	19-20.9	21+	Stand Mortality (%)
	Frequency (%)	34	0	0	0	2	7	13	15	13	9	4	2	
NO ACTION		S	p	p	p	p	p	A	A	A	A	A	A	97

S = Surface fire P = Passive crown fire A = Active crown fire

3.6.2.2 Alternative 2 Effects to Fire Hazard

Density management treatments can substantially influence subsequent fire behavior at the stand level by either increasing or decreasing fire intensity and associated severity of effects (Graham et al. 1999). These vegetation/fuel parameters can be altered following vegetation/fuel treatments in the middle and upper canopies. Depending on intensity, thinning from below can most effectively alter fire behavior by reducing CBD, increasing CBH, and changing species composition to lighter crowned and fire-adapted species (Graham et al. 1999).

Under the Proposed Action Alternative approximately 468 acres of understory thinning and 432 acres of density management thinning is proposed for treatment. Biomass removal is proposed for the density management thinning units. Units or partial units where biomass removal are not feasible due to economics or where activities would exceed RMP soil compaction or water quality guidelines, lop and scatter and/or handpile and handpile burn methods would be implemented to meet the desired stand prescription and decrease the fire hazard.

The density management thinning units may be recommended for lop and scatter to prevent concentrations of slash and to arrange the material in a discontinuous pattern where the average fuel bed is less than 1 foot in height. Where post-treatment field review indicates a heavy concentrations of slash (greater than 1 foot in height) and a continuous pattern, the recommended treatment would be to hand pile and burn to decrease the fire hazard.

Direct Effects-Fire Hazard

Short term negative effects in terms of increases in fire hazard would occur due to the presence of activity slash on site in the form of hand piles, landing piles and lop and scatter. This is considered a short term effect because the piles are burned once they cure out within two years. Lop and scatter activity fuels would increase in fire behavior in the short term (1 - 3 years) until the activity slash decomposes or treated by underburning. Factoring in alternative slash treatments that do not generate piles (such as biomass utilization, lop and scatter, and underburning) it is estimated that 500 acres of hand piles could be generated and 20 acres of landing piles.

Understory Thinning

Under Alternative 2, surface and ladder fuels would be reduced, through understory thinning. Under the treatments proposed in the Proposed Action, flame lengths would be below the 4 foot threshold for direct attack suppression and fuel models would be reduced.

Density Management Thinning

Modeling results for the Proposed Action showed a general reduction in crown bulk density relative to stand conditions under the No Action Alternative. Crown base heights would also be raised under Alternative 2.

These changes to the fuel complex would result in surface flame lengths (2 ft) that would not be able to reach into the bulk of the aerial fuels, reducing the potential for crown fire initiation and high severity, stand-replacement fires.

Table 8. The predicted direct effects of Alternative 2 to characteristics of the Fuel Complex (Flame Height, Crown Base Height, and Crown Bulk Density) based on plot data from representative stands.

	Flame Height (ft)	Avg. CBH (ft)	Avg. CBD (kg/m3)	Fire Behavior Fuel Model
Understory Thin	2	10	0.072	TL3
Density Management (60%)	2	24	0.072	TL3
Density Management (40%)	2	38	0.044	TL3

Indirect Effects-Fire Hazard

Long term beneficial effects would occur on a landscape on approximately 900 acres implementing Understory Thinning and Density Management Thinning treatments.

Understory Thinning and Density Management Thinning

The weather analysis indicated that 34% of days in the last 100 of the fire season exhibited environmental conditions that would only support a surface fire and for the remaining days, the combined effects of the thinning treatments proposed under the action alternative resulted in reduced potential fire behavior. Thus 100% of days in the latter portion of the fire season exhibited no potential for crown fire activity (Table 9). For all proposed actions the predicted stand mortality associated with the surface fire was 16% or less (Table 9).

Table 9. Wind speed frequency, predicted stand mortality and fire type for the late summer and early fall fire season for representative stands under the Alternative 2.

		90th Percentile Fire Behavior Analysis May01-Oct31 (2000-2009)												
RAWS Calvert (3822 elev)	Wind Speed (mph)	surf	1-2.9	3-4.9	5-6.9	7-8.9	9-10.9	11-12.9	13-14.9	15-16.9	17-18.9	19-20.9	21+	Stand Mortality (%)
	Frequency (%)	34	0	0	0	2	7	13	15	13	9	4	2	
Understory Thin		S	S	S	S	S	S	S	S	S	S	S	S	16
Density Management (60%)		S	S	S	S	S	S	S	S	S	S	S	S	12
Density Management (40%)		S	S	S	S	S	S	S	S	S	S	S	S	7

S = Surface fire

Cumulative Effects on Fire Hazard under Alternative 2

Alternative 2 would restore, maintain and enhance fire-adapted ecosystems by reducing fire hazard by treating strategic locations within the landscape. In the event of a wildfire, these strategic locations may be utilized for fire suppression activities to contain a fire within the Planning Area, or conversely, to prevent a fire from entering it. As such, the Fire Resiliency Planning Area boundary lends itself to a logical scale to conduct fire hazard cumulative effects analysis.

The Reuben Hazardous Fuels Reduction Project is the one federal project foreseeable within the Fire Resiliency Project cumulative effects analysis area. The Project would include 1,076 acres of hazardous fuel reduction and 432 acres of biomass removal on forest lands. The slash would

be treated using one or more of the following actions: handpile and burn, lop and scatter, or biomass removal. The majority of the Westside Project hazardous fuel (988 acres) has been implemented on federal lands within the Fire Resiliency Planning Area. Approximately 207 acres of hand piled burning exist and is planned for the upcoming winter. Maintenance underburning may occur on 200 acres within 7 years following initial treatments and would be driven by the condition of the stand and re-growth of slashed vegetation.

The cumulative beneficial effects of the Fire Resiliency Project are measured in terms of fire hazard. Current hazardous fuels reduction projects that are in progress were designed to reduce the existing fire hazard by removing some of the surface and ladder fuels. By treating the understory vegetation, potential fire behavior is reduced to surface fires and passive crown fires. The understory thinning and density management thinning treatments proposed under Alternative 2 are designed to accomplish the same objective. Westside Project and Reuben Hazardous Fuels Reduction Project acres combined with the proposed acres with Alternative 2 would result in a cumulative short term increase six months to 3 years in fire hazard due to the presence of slash or until the time it is treated and/or partially decomposed and a long term beneficial effect in terms of decreased fire hazard on approximately 2,958 acres for the next 10 to 20 years.

3.7 Northern Spotted Owl (Threatened) and its Habitat

3.7.1 Affected Environment Northern Spotted Owl and its Habitat

Under consultation with the U.S. Fish and Wildlife Service (Medford BLM July 2010 NLAA BA) impacts from the proposed Fire Resiliency Project were evaluated at both the local (Fire Resiliency Project Planning Area) and provincial level (Klamath Province), based upon activities in suitable (nesting, roosting, foraging) and dispersal habitat.

A large majority of the late-successional habitat in the Planning Area occurs on BLM lands. It is expected that private timber lands will continue to be cut on a 50-80 year rotation. As a result, northern spotted owl habitat is expected to be limited to federal lands.

Habitat suitability for spotted owls includes a composition of multiple habitat elements such as canopy closure, canopy layering, trees with nesting structure such as platforms and cavities, snags, down wood, flying space, shrubs and forbs ground cover, and prey items. Habitat suitability for each forest stand is determined by field review. Northern spotted owl suitable habitat includes stands suitable for nesting, roosting, and foraging. There are two categories of suitable habitat. “Habitat 1” conifer stands satisfy the daily and annual needs of the owl for nesting, roosting and foraging. These stands generally have a multilayered canopy with large trees in the overstory and an understory of shade tolerant conifers and hardwoods. Canopy closure generally exceeds 70%, and average DBH is generally 21 inches or greater. “Habitat 2” suitable habitat includes conifer stands with understory vegetation or coarse woody debris which provide roosting and foraging opportunities but lack the necessary structure for consistent nesting. These stands have less diversity in the vertical structure and canopy closure generally exceeds 70% and average DBH is 11- 21 inches. Dispersal (non-suitable) habitat generally includes conifer stands with trees greater than or equal to 11 inches DBH and canopy closure of

40-60%, but may have higher canopy cover and lack other habitat components to adequately support residential occupation, or have lower canopy cover and include habitat components such as understory, down wood, snags, or scattered remnant trees that increases utility.

Extensive harvesting on BLM occurred in the Planning Area prior to the 1990 listing of the spotted owl as a threatened species, and the implementation of the NWFP in 1994. The Middle Fork Cow Creek Watershed Analysis (BLM 1999, p.37) notes late-successional stands in these watersheds are highly fragmented and frequently isolated from other late successional stands because of the checkerboard pattern of federal land ownership and past logging practices. Harvesting on private lands continues to be extensive. Most private land has been intensively harvested, much of it in the last few decades

One of the functions of Matrix lands is to serve as connectivity between Late Successional Reserves (USDA/USDI. 1994, FSIES Vol 1, Appendix B-43). Connectivity/Diversity Blocks are generally square-mile sections in which at least 25-30 percent of each block will be maintained in mature and old growth seral stages (80+ years old). They are designed to promote movement of late-successional species across the landscape and add richness and diversity to the land outside Late Successional Reserves (LSRs). Approximately 50% of the forest in Connectivity/Diversity Block T32S-R6W Section 1 is at least 80 years old, and 60% of the forest in Connectivity/Diversity Block T33S-R7W Section 1 is at least 80 years old.

Owl sites found after January 1994 receive no mandatory protection, except for the nest site and seasonal restriction. Demographic data from northern spotted owls in the Klamath Demographic Study Area collected from 1985 – 2003 indicate that populations appear to be stable in the Klamath study area as a result of high survival and number of young produced by territorial females, which were stable over the period of the study (Anthony et al. 2004).

Status and Trend of Northern Spotted Owl Populations

The Bureau of Land Management (BLM), Forest Service (FS), and U.S. Fish and Wildlife Service (USFWS) have conducted a coordinated review of four recently completed reports containing information on the northern spotted owl (NSO). The reviewed reports include the following:

- *Scientific Evaluation of the Status of the Northern Spotted Owl* (Sustainable Ecosystems Institute, Courtney et al. 2004);
- *Status and Trends in Demography of Northern Spotted Owls, 1985-2003* (Anthony et al. 2004);
- *Northern Spotted Owl Five Year Review: Summary and Evaluation* (USFWS 2004); and
- *Northwest Forest Plan – The First Ten Years (1994-2003): Status and trend of northern spotted owl populations and habitat, PNW Station Edit Draft* (Lint 2005).

Anthony et al. (2004, 2006) is the most recent meta-analysis of owl demographic data collected in 14 demographic study areas across the range of the northern spotted owl. Four of the study areas are in western Washington, six are in western Oregon, and four are in northwestern California. Although the agencies anticipated a decline of NSO populations under land and resource management plans during the past decade, the reports identified greater than expected

NSO population declines in Washington and northern portions of Oregon, and more stationary populations in southern Oregon and northern California.

Summarizing Anthony et. al., between 1985-2003:

- The northern spotted owl population declined over its entire range, and varied from the most pronounced in Washington (7.3% year per) to the least pronounced in California (2.2%).
- Within Oregon, the northern demographic study areas averaged 4.9% population decline, and the southern study areas decline averaged less than 1% per year and were statistically stable, with a western Oregon average of 2.8% decline per year.
- Range-wide, adult survival rates declined in 5 of 14 study areas (western Washington and northwestern California) and western Oregon was stable in all six study areas.

The reports did not find a direct correlation between habitat conditions and changes in NSO populations, and they were inconclusive as to the cause of the declines. Even though some risk factors had declined (such as habitat loss due to harvesting) other factors had continued such as habitat loss due to wildfire, potential competition with the barred owl, West Nile virus, and sudden oak death (USFWS 2004, Lint 2005). The barred owl is present throughout the range of the spotted owl, so the likelihood of competitive interactions between the species raises concerns as to the future of the spotted owl (Lint 2005). Lint (2005) also found that between 1994-2003, federal lands in the Klamath Province lost 6.6% of spotted owl nesting habitat to stand-replacement fire, mainly to the Biscuit Fire (almost 500,000 acres).

Collected information indicates that encounters between spotted owls and barred owls tend to be agonistic in nature, and that the outcome is unlikely to favor the spotted owl (Courtney et al. 2004). Olson et. al. (2005) suggests that further declines in the proportion of sites occupied by northern spotted owls are likely. Olson et al. (2005) showed that barred owl presence had a negative effect on northern spotted owl detections probabilities, and it had either a positive effect on local extinction probabilities (at the territory scale) or a negative effect on colonization probabilities for three study areas in Oregon. Although the barred owl currently constitutes a greater threat to the northern spotted owl than originally thought at the time of the listing (Courtney et al. 2004), at present it is unclear whether forest management influences the outcome of interactions between barred and northern spotted owls (Courtney et al. 2004; summarized by Lint 2005).

The decrease in spotted owl detections since 2002 corresponds to an increase in barred owl presence (Davis et. al. 2010; Forsman et al 2009). It has been shown (Bailey et al. 2009; Crozier et al. 2006) that the presence of barred owls negatively affects the detection probabilities of spotted owls. This may account for some of the decrease in spotted owl detections; however, it is quite possible the barred owl is actually having an impact on the population and the population on the Klamath Study Area (KSA) may be experiencing these effects (Davis et al. 2010).

There is mounting evidence that barred owls are having a negative impact on the spotted owl population within the KSA. This is illustrated by several population trends beginning about 2003 which is when barred owl detections at sites within the KSA exceed 10%. Spotted owl

detections have been steadily decreasing since 2002 and reached the lowest point in 2009, the same year barred owl detections reached their highest level (Davis et. al. 2010).

Barred owls have been detected in the following spotted owl sites: Lawson Creek and Woods Creek South. The Planning Area borders the Klamath NSO Demographic Study Area (KSA), where upward trend of spotted owl sites with barred owl detections has occurred. It has been shown (Bailey et al. 2009, Crozier et al. 2006) that the presence of barred owls negatively affects the detection probabilities of spotted owls. Barred Owl presence appeared to have a negative influence on spotted owl survival (Anthony et al. 2006). Decrease in spotted owl detections since 2002 corresponds to an increase in barred owl presence (Davis et. al. 2010; Forsman et al 2009). This may account for some decrease in spotted owl detections; however, it is quite possible the barred owl is actually having an impact on the spotted owl population and the population on the Klamath Study Area (KSA) may be experiencing these effects (Davis et al. 2010).

The findings by Anthony et al. (2004) are now five years old, and there is a lag time between when a population change occurs and when it statistically is verified. For this reason, the analysis regarding significant population decline, addresses all of western Oregon (BLM 2008c, p.3-298). The role of critical habitat to provide nesting, roosting, foraging, and dispersal would remain unchanged; however, the effectiveness of critical habitat and the rate of population decline beyond the most recent meta-data analysis (Anthony et al. 2004) would be uncertain.

In 2008, the USFWS released a final recovery plan for the northern spotted owl that identified criteria and actions necessary to stop the owl's decline, reduce threats, and return the species to a stable, well distributed population in Washington, Oregon, and California (U.S. Fish and Wildlife Service 2008b). Facing lawsuits by conservation and timber groups, the Federal government announced it would conduct a thorough review of the Recovery Plan prior to its full implementation. A review is currently being conducted by USFWS and a final recovery plan is anticipated to be completed by the end of 2011.

The recovery plan is not a regulatory document; rather, it provides guidance to bring about recovery and establishes criteria to be used in evaluating when recovery has been achieved. The recovery plan identified the primary threats facing the northern spotted owl and described 34 recovery actions to address these threats.

RA 32 (Spotted owl Recovery Action 32) recommends agencies maintain substantially all of the older and more structurally complex, multilayered conifer forests on federal lands (U.S. Fish and Wildlife Service 2008b, 34). These forests are characterized as having large diameter trees; high amounts of canopy; multiple layers; and decadence components such as broken-topped live trees, mistletoe, cavities, large snags and large coarse wood.

Eight known spotted owl sites (Lawson Creek, North Lawson, Woods Creek South, Perkins Creek, Reuben Rattle, Baby Rattle, Section Creek, Rattlesnake,) are likely to be affected by modification of NRF habitat within Fire Resiliency Project units, and are surveyed to protocol annually. It is unlikely that more residential sites occur in the Planning Area based on annual surveys conducted within the surrounding NSO Klamath Demographic Study Area. The current Lawson Creek site was designated as site in 1997 but has no nesting or likely nesting confirmed for the site based on current and historical protocol surveys. One hundred acre core areas were

designated for Perkins Creek and Rattlesnake owl sites under the 1995 RMP and are not modified by the Proposed Action. Seventy-acre nest patches (300 meter radius) have been delineated around nesting or likely nesting sites (USDA/USDI 2008) and are excluded from the Proposed Action. Nest Patch area arrangement and nest patch size have been shown to be an important attribute for nest site selection by spotted owls.

3.7.2 Environmental Consequences Northern Spotted Owl and its Habitat

3.7.2.1 Alternative 1 (No Action) Effects on Spotted Owl and its Habitat

Under the No Action Alternative, no harvest would occur under this project. Wildfire would remain the most immediate hazard to late-successional forest habitat and associated species (Courtney et al. 2004). Growth of late-successional forest habitat or of young stands toward late-successional forest habitat under this alternative is uncertain. The unthinned second-growth stands with high tree densities may not develop the large crowns and diameters of historical open-grown trees. In southwest Oregon, the reduction in fire frequency has reduced the role of fire as an ecological factor, influencing stand development and altering historic forest structures, processes, and functions. The development of large tree structure comparable to that of remnant trees used by late-successional dependent species would not be likely to occur. This is because current stand conditions are too dense and trees are not developing the diameter to height ratio required to develop this structure. This ratio was historically created through frequent fire events that reduced stem densities and competition that created open grown conditions. Other disturbances, such as insect infestations, diseases, and windthrow, would have historically thinned out stands, created gaps, and created more complex stand structure. Current stand conditions would likely develop into less complex stand structures and species compositions than that of old-growth stands (Sensenig 2002).

BLM standard road maintenance, including activities such as road surface, ditch, road bank and fills, hazardous tree removal, culvert replacement, would occur and not downgrade the spotted owl habitat. Temporary and permanent right-of-way construction would continue on private lands and potentially on BLM consistent with reciprocal right-of-way agreements to allow private harvesting, resulting in the potential for removal of suitable and dispersal habitat.

3.7.2.2 Alternative 2 Effects to Spotted Owl and its Habitat

Under the Proposed Action, spotted owl habitat would be maintained on approximately 595 acres of nesting, roosting, and foraging (NRF) habitat and 238 acres of dispersal habitat (see Table 2-2 for further details). Temporary route construction (totaling approximately 2.0 miles) would not occur within 70 acre nest patches or in NRF habitat within the heavily foraged spotted owl core areas (500 acres) of any known occupied or historically occupied spotted owl sites. The temporary construction occurs on ridgetops or upper slopes and avoids habitat used most for nesting or roosting, as owls typically use the lower two thirds of slopes (Blakesley et. al., 1992; Hershey et. al., 1998)

BLM would maintain the characteristics that classify a stand as NRF or dispersal habitat throughout the treatments for no loss of NRF or dispersal habitat. Treatments would retain the canopy percentages, structural components and species diversity important to owls and their

habitat. The age of NRF stands in the Proposed Action vary from approximately 70 to 190 years. The dispersal habitat units vary from approximately 30 to 60 years old.

The function of owl habitat in each unit would be maintained. Nesting, roosting, and foraging habitat would retain at least 60% canopy cover, and when present, a multi-storied, multi-species canopy with large overstory trees, larger trees with various deformities, large snags, accumulations of fallen trees and wood on the ground, and remnant trees or leave trees from previous harvesting would be retained. Dispersal habitat would maintain at least 40% canopy closure (50% in treated EPZ in RR), and retain existing large dead wood and dominant trees. Dispersal habitat provides temporary shelter for northern spotted owl moving through the area between NRF habitat and some opportunity for northern spotted owl to find prey, but does not provide all of the requirements to support an owl throughout its life.

RA 32 forest stands are the highest quality nesting, roosting, and foraging habitat. Field review determined approximately 68 acres in 16 habitat areas ranging from 1 to 12 acres, met RA 32 stand conditions. Maintaining 40% canopy in dispersal habitat and 60% canopy with nesting, roosting and foraging habitat components in treatment areas adjacent the deferred RA 32 habitat maintains the function of substantially older and more structurally complex multi-layered conifer forests on federal lands.

Connectivity/Diversity Blocks

Forest connectivity would be maintained within Connectivity/Diversity Blocks (T33S-R7W Section 1; T32S-R6W Section 1) by retaining approximately at least 40% canopy cover in younger forests (<80 years) and at least 60% canopy in older forests (approximately ≥80 years), as well as retaining snags, large down wood, and large dominant trees.

Density Management and Understory thinning in Connectivity/Diversity Block T33S-R7W-Section 1 (Stevens Creek) would maintain habitat conditions in approximately 117 acres of young forest and 18 acres of late-successional forest. Density Management and Understory thinning in Connectivity/Diversity Block T32S-R6W-Section 1 (Windy Creek) would maintain habitat conditions in approximately 175 acres of late-successional habitat.

Within the Stevens Creek Connectivity/Diversity Block, units 1-3R and 6-2R would apply 25 acres of Understory Thinning in late-successional forest. Midstory and overstory conditions would be maintained while thinning understory ladder fuels to retain suitable NRF habitat conditions for spotted owls, as well as dispersal habitat for other wildlife dispersing to late-successional habitat. Additionally, 1-3R would apply 32 acres of Density Management thinning to young (40 years old) overstocked second-growth forest plantation. Unit 6-1R would treat 37 acres with Density Management thinning to maintain 40% canopy cover and suitable spotted owl dispersal habitat conditions, as well as dispersal habitat for other wildlife dispersing to late-successional habitat. Construction of approximately 2 temporary spurs (800 feet) would not preclude dispersal habitat function within the blocks.

Within the Windy Creek Connectivity/Diversity Block, units 1-3L and 1-4L would apply 93 acres of Density Management thinning in forest less than 80 years old. Unit 1-3L would also treat 38 acres of late-successional forest (80+ years old) with Density Management. Units 1-1L and 1-2L would apply 139 acres of Understory Thinning in forest 80+ years. All units within the

Connectivity Block would maintain 60% canopy cover for suitable spotted owl habitat conditions. Retaining high canopy cover, large dominant trees, snags, large down wood, and tree species diversity provide key forest habitat elements to support conditions for other wildlife species dispersing to late-successional habitat. Construction of approximately 2 temporary spurs (970 feet) would not preclude the dispersal habitat function within the blocks.

Road Construction

Lawson requires 0.85 miles of temporary routes in RF habitat upper slope/ridgetop (17 spurs; and Rattlesnake requires 1.15 miles of temporary routes in dispersal habitat (13 spurs in unit 6-1R 0.9 mi) and 2 spurs in 11-2R (0.15 mi) and 0.1 in non-habitat.

Trees removed from approximately 2.0 miles of temporary route construction, would not cause any measurable change in spotted owl nesting, roosting, foraging, or dispersal use of the landscape due to the narrow linear nature of the tree removal for these proposed activities. Temporary route construction would occur on ridgetops and upper slopes in roosting/foraging or dispersal habitat and avoids old-growth stands and lower slopes where habitat use by spotted owls is greatest (Blakesley et. al., 1992; Hershey et. al., 1998) and avoids nest patches. No temporary route construction would occur in NRF habitat in heavily used spotted owl core (500 acre) areas.

Prey Species

Treatments would sustain the ecological health of the stand and maintain vegetation important to spotted owl prey. Thinning would remove some trees that could be utilized for roosting, perching for hunting, or nest structure support for prey such as red tree voles or flying squirrels. Dominant trees with large crowns and branches which provide best structure for arboreal mammalian nests, are typically selected for retention.

Treatments that reduce tree density, reduce canopy cover, reduce shrubs and understory vegetation and open the stand to more light and nutrients will affect different prey species in various ways, depending on the condition of the prey habitat prior to treatment, the prey habitat post treatment and complex interactions among the prey/predator community. Suzuki and Hayes (2003) evaluated the response of ground-dwelling mammals to Oregon Coast Range forest thinning and found that thinning appeared to increase the abundance of small mammals, and maintains or enhances habitat quality in the long or short term. All species except Western red backed voles exhibited increases over a three year period following heavy and moderate thinning as compared to controls, presumably because these species were responding to the increased forage caused by the additional light in the stand. Habitat for western red backed voles was expected to improve in treated stands over the long term (Suzuki and Hayes 2003).

Arboreal prey species may respond to thinning differently than small ground mammals. Flying squirrels are largely arboreal, moving from tree-to-tree in the canopy. Gomez et. al. (2005) found that thinning in young Douglas fir stands in the northern coast range did not have measureable short term effects on density, survival or body mass of flying squirrels.

Timber harvest and associated activity fuels treatment may impact foraging by changing habitat conditions for prey. Sakai and Noon (1993) stated that dusky-footed woodrats, the primary prey of owls in our area, may benefit from some thinning or harvest which would increase shrub and

pole stands. Bushy-tailed woodrat presence is more dependent on cover and food availability than on seral stage and often use areas previously disturbed by fire (Carey 1991).

Heat and smoke from activity fuels treatments is not expected to change prey population levels. Slash pile burning either has low flame lengths of short duration with heat or smoke that dissipates prior to entering crowns, or piles are burned outside of the crowns of trees to avoid branch and needle scorch of retained trees.

Small openings in the stands would occur where trees are harvested. Prey animals may be more exposed in the disturbed area or may move away from the disturbed area for the next few years. Some minor changes in prey availability may occur as cover is disturbed and animals move around in the understory. They may become more vulnerable and exposed. The disturbance might attract other predators such as other owls, hawks and mammalian predators. This may increase competition for owls in the treatment area, but the exposure of prey may also improve prey availability for northern spotted owls.

Some disturbance from thinning habitat may improve forage conditions where canopy and tree stem density is too high and excludes light and ground cover is sparse. Removal of some tree canopy would bring more light and resources into the stand, stimulating forbs, shrubs and other prey food. Once the initial impact of disturbance recovers (6 months to 2 years), the understory habitat conditions for prey food may increase over the next few years, until tree canopy growth increases the canopy closure and begins excluding light.

3.7.2.3 Cumulative Effects of Alternative 2 on Spotted Owl and its Habitat

Cumulative effects to spotted owls result from the incremental impact of the Proposed Action, added to other past, present, and reasonably foreseeable actions regardless of land ownership. The majority of remaining older forest for spotted owls affected by this project is on public lands managed by BLM. Past activities have resulted in habitat loss and have changed the distribution and abundance of many wildlife species. Species associated with younger forested conditions have benefited from these changes. Habitat modification and removal with fewer or lesser protection measures would continue on private, county, or state lands, which negatively affect late-successional dependent wildlife species on these lands.

Extensive harvesting on BLM occurred in the Planning Area prior to the 1990 listing of the spotted owl as a threatened species, and the implementation of the NWFP in 1994. The Middle Cow Creek Watershed Analysis notes these watersheds have been greatly affected by timber harvest. Most of the private lands have been logged, as well as many acres of BLM lands. Logging has also removed and fragmented the older forest habitat.

The 1995 RMP/EIS assumed that in the future nonfederal lands would have no suitable habitat (BLM 1995, p.4-73) due to 50-80 year rotations on private lands, but are expected to provide some dispersal habitat. The cumulative effects are the combination of the Proposed Action (maintaining owl habitat conditions on approximately 595 acres of NRF and 238 acres of dispersal habitat through moderate to light thinning, temporary route construction, and road maintenance), combined with other recent and foreseeable projects.

The Fire Resiliency Project Planning Area is heavily affected by large-scale fragmentation from past federal and private harvesting, and particularly recent extensive private harvesting (see Section 3.4.1.1). Proposed thinning, and daylighting road maintenance, temporary route construction and reconstruction would not increase late-successional habitat fragmentation for spotted owls. The effects of removal of small diameter trees (< 24 inches DBH) along roads is not expected to measurably affect spotted owl habitat use, occupation, or survivability, which are associated with late-successional and old-growth (nesting, roosting and foraging) habitat.

There are no foreseeable activities that would contribute to reduced viability of the owl sites through reduction of available habitat utilized for nesting, roosting and foraging, or reduction of dispersal capability.

There are three recent projects which effect owls also afected by the Fire Resiliency Project; the Reuben Hazardous Fuels Reduction Project, the Revised Wolf Pup Project, and the Westside Fuels Project.

The Reuben Hazardous Fuels Reduction Project would maintain habitat conditions on approximately 370 acres of owl nesting, roosting & foraging habitat in T33S-R7W-Sections 3, 9, & 11. This project is designed to retain canopy cover of dominant and intermediate canopies, large trees and snags, large down wood, and some structural diversity important to spotted owls and prey species. The hazardous fuels reduction treatments would reduce understory and brush components, but retain 10-15% untreated areas, providing owl prey habitat. Vegetation under one inch diameter and under one foot in height would not be removed, and approximately 14-20 ft spacing on small diameter conifer trees and up to 40 ft spacing for hardwoods would maintain mid-story and understory habitat components within treated areas. Treatments areas would be spread out spatially and temporally over approximately 5 years with and may be followed with a maintenance underburning. These actions would not cause disturbance to nesting owls. The treatment proposed would occur within the home range of the Perkins Creek, Reuben Rattle, and Rattlesnake owls sites which also are affected by the Fire Resiliency Project.

The Wolf Pup Project would thin and maintain at least 60% canopy cover in 140 acres of NRF habitat, retaining multi-species canopy layering with large overstory trees; a high incidence of larger trees with various deformities, large snags, and fallen trees and wood on the ground. Fifteen acres of dispersal habitat would maintain at least 40% canopy closure and approximately 0.75 miles of roadside treatment would remove narrow strips of second growth/ dispersal-size trees (8-24 inch dbh). These treatments effect Perkins Creek, Reuben Rattle and Rattlesnake owl sites which are also effected by Fire Resiliency Project units.

Westside Hazardous Fuels Reduction treats approximately 436 acres of understory fuels and approximately 200 acres of maintenance underburning after pile burning, within the home range of North Lawson, Lawson Creek and Woods Creek owl sites which are also effected by Fire Resiliency Project units. Treatment areas would be spread out spatially and temporally over approximately 7 years with and may be followed with a maintenance underburning. These actions would not cause disturbance to nesting owls. Nesting, roosting and foraging conditions are maintained by both projects.

The recent activities combined with the Fire Resiliency Project would maintain habitat function in NRF and dispersal habitat, and would not contribute to reduced viability of the owl sites

through reduction of available habitat utilized for breeding, nesting, feeding, sheltering, or dispersing.

The combined consequences of these projects, including the reduced viability of owl sites on Matrix lands from federal and private harvesting, were anticipated in the NWFP (USDA/USDI. 1994 3&4-241). Under the NWFP, only Matrix based spotted owl sites identified as of January 1994 received 100 acre residual habitat areas, which were not considered adequate to maintain reproductive owl pairs (USDA/USDI 1994 3&4-241) and provide for the long-term needs of owl pairs. The function of Matrix lands is to serve as connectivity between Late-Successional Reserves (USDA/USDI. 1994b vol 2, p. B-43). Remaining nesting habitat on private land is not expected in the future to be suitable habitat, given a stand age rotation of 50-80 years (1994 PRMP/EIS, pp.4-5, 4-73).

3.8 Northern Spotted Owl Critical Habitat

3.8.1 Affected Environment Northern Spotted Owl Critical Habitat

The Proposed Action does not occur in Revised Critical Habitat (2008; Federal Register (73): 47326-47522), as designated by the U.S. Fish and Wildlife Service (USFWS). Northern spotted owl Critical Habitat was first designated for the northern spotted owl in January 1992 (Federal Register (57):1796-1838). Fire Resiliency Project units 11-2R, 11-3R, and 11-1R occur in the 1992 Critical Habitat Unit (CHU) #OR-64.

Critical habitat, as defined in Section 3 of the Endangered Species Act, is "the specific areas within the geographic area occupied by a species…on which are found those physical or biological features essential to the conservation of the species," (USDI 1992). These features are referred to as the primary constituent elements which support the life requisites of nesting, roosting, foraging, and dispersal. As the USFWS noted in its Biological Opinion on the NWFP, for a wide-ranging species such as the spotted owl, each Critical Habitat Unit (CHU) has both a local role and a rangewide role (USDI USFWS 1994, p.20). Impacts from proposed harvest therefore are evaluated based upon removal, downgrading, and degradation of suitable (nesting, roosting, foraging) habitat and dispersal habitat, and are evaluated at both the local level and the provincial level.

OR-64 is located on Medford District BLM and in Josephine and Douglas Counties. No Late Successional Reserve (LSR) allocation is within this unit. This unit was established to maintain the remaining owl habitat between units OR-65 and OR-32. This unit is along the western end of the Rogue-Umpqua portion of the I-5 Area of Concern. This connection between the Coast Ranges Province and the Western Cascades Province is threatened by its current habitat condition, its high fragmentation by past management practices, and land ownership patterns. This unit provides a link where range-wide distribution can be maintained, (USDA/USDI 2006 BA, App. B-18).

The Fire Resiliency Planning area is located in 1992 CHU OR-64. This CHU was established to maintain essential nesting, roosting, foraging, and dispersal habitat along with clusters of owls. Located between 1992 CHU OR-65 and 1992 CHU OR-62, CHU OR-64 provides an important stepping stone of nesting habitat for owls to OR-32 which is along the western end of the Rogue-

Umpqua portion of the I-5 area of concern. This connection between the Coast Ranges and Western Cascades provinces was identified by the Service as an area, due to past harvest practices, current habitat conditions, and land ownership, the importance of maintaining suitable nesting, roosting, foraging, and dispersal habitat has escalated. Given their importance to maintaining range-wide distribution of the owl, this smaller stepping stone CHU was established to help maintain and improve what little spotted owl habitat still exists.

As a result of past harvest and conditions within unmanaged stands in this CHU, an estimated 3,277 of 5,653 federal acres federal acres is currently suitable for nesting, roosting and foraging (BLM 2009 p. 22). All in this CHU are managed by the BLM. Approximately 75% of the CHU is on federal land, and approximately 58% of federal ownership is suitable spotted owl habitat.

3.8.2 Environment Consequences Northern Spotted Owl Critical Habitat

3.8.2.1 Alternative 1 (No Action) Effects on Spotted Owl Critical Habitat

Under the No Action Alternative, no habitat would be treated in the 1992 Critical Habitat Unit (CHU).

Growth of dispersal and late-successional and old-growth forest habitat would continue. If harvesting is deferred, older stand development would continue to contribute standing dead and downed wood and maintain high levels of canopy closure. However, stands would likely be reviewed under future actions for harvesting or fuels reduction and would not likely support additional productive owl sites, as overlapping home ranges already occur in the Planning Area. Growth of late-successional forest habitat or of young stands toward late-successional forest habitat under this alternative is uncertain. The unthinned second-growth stands with high tree densities may not develop the large crowns and diameters of historical open-grown trees. Fire hazard would continue to increase and be the highest threat to habitat loss in forest stands where the density of hardwood and conifer stems and fuel ladders is high. Tree mortality in overstocked stands would continue to increase.

Temporary and permanent right-of-way construction would continue on private lands and potentially on BLM consistent with reciprocal right-of-way agreements to allow private harvesting, resulting in potential removal of suitable and dispersal habitat.

Even though some risk factors to habitat use in 1992 CHU have declined (such as habitat loss due to federal harvesting) other factors continue such as habitat loss due to wildfire, increased competition with the barred owl, West Nile virus, and sudden oak death (USFWS 2004, Lint 2005). The barred owl is present throughout the range of the spotted owl, so the likelihood of competitive interactions between the species raises concerns as to the future of the spotted owl (Lint 2005; Anthony et al. 2006). Lint (2005) also found that between 1994-2003, federal lands in the Klamath Province lost 6.6% of spotted owl nesting habitat to stand-replacement fire, mainly to the Biscuit Fire (almost 500,000 acres). However, the findings by Anthony et al. (2004) are now five years old, and there is a lag time between when a population change occurs and when it statistically is verified. For this reason, the analysis regarding significant population decline, addresses all of western Oregon (BLM 2008b, p.3-298). The role of critical habitat to provide nesting, roosting, foraging, and dispersal would remain unchanged; however, the

effectiveness of critical habitat and the rate of population decline beyond the most recent meta-data analysis (Anthony et al. 2004, 2006) would be uncertain.

3.8.2.2 Alternative 2 Effects on Spotted Owl Critical Habitat

No direct or indirect effects would occur to the Revised 2008 Critical Habitat.

Approximately 99 acres of nesting, roosting and foraging habitat (unit 11-1R) within the 1992 CHU OR-64 would be treated with Understory Thinning and retain current midstory and overstory canopy closure and the primary constituent elements supporting breeding, foraging and sheltering. No change in levels of available prey is expected to occur from the understory fuels treatment. Fire Resiliency Project units 11-2R and 11-3R would treat and maintain 40 acres of dispersal-only habitat and maintain at least 40% canopy closure to provide dispersal cover. Approximately 2% of the 5,653 federal acres in this CHU would be treated and retain biological function supporting breeding, foraging and sheltering and dispersal. The reduction of canopy cover in dispersal habitat would be regained in approximately 15-20 years. Construction of 3 temporary spurs on or near ridgetops (units 11-2R and 11-3R) would remove small diameter trees to facilitate thinning densely stocked second growth plantation units and would not preclude dispersal function of these units within the CHU.

No change to baseline acres of nesting, roosting, foraging, and dispersal habitat would occur in the Proposed Action, and primary constituent elements would be maintained in all units, and at the forest stand level.

3.8.2.3 Alternative 2 (Proposed Action) - Cumulative Effects on Spotted Owl Critical Habitat

Cumulative effects in CHU OR-64 result from the incremental impact of Alternative 2, added to other past, present, and reasonably foreseeable actions. No foreseeable federal projects are anticipated to occur in CHU OR-64. The majority of remaining older forest in this CHU is on public lands managed by BLM. Past activities have resulted in habitat loss and have changed the distribution and abundance of many wildlife species in the CHU. Species associated with younger forested conditions have benefited from these changes. Habitat modification and removal with fewer protection measures would continue on private or county lands, which negatively affect suitable and dispersal CHU habitat for northern spotted owls. Due to 50-80 year rotations on private lands, private lands would not provide suitable spotted owl habitat, but are expected to provide some dispersal habitat.

Extensive harvesting on BLM occurred in the CHU prior to the 1990 listing of the spotted owl as a threatened species, and the implementation of the NWFP in 1994. Late-successional stands in this watershed are highly fragmented and frequently isolated from other late successional stands because of the checkerboard pattern of federal land ownership and past logging practices. Approximately 58% of federal ownership is suitable spotted owl habitat as a result of past federal harvesting (BLM 2009, p. 22). Harvesting on private lands continues to be extensive. Most private land has been intensively harvested, much of it in the last few decades.

There are two recent projects which also occur in CHU-64; the Reuben Hazardous Fuels Reduction Project, and the Revised Wolf Pup Project.

The Reuben Hazardous Fuels Reduction Project would maintain habitat conditions on approximately 370 acres of owl nesting, roosting & foraging habitat. This project is designed to retain canopy cover of dominant and intermediate canopies, large trees and snags, large down wood, and some structural diversity important to spotted owls and prey species. The hazardous fuels reduction treatments would reduce understory and brush components, but retain 10-15% untreated areas, providing owl prey habitat. Vegetation under one inch diameter and under one foot in height would not be removed, and approximately 14-20 ft spacing on small diameter conifer trees and up to 40 ft spacing for hardwoods would maintain mid-story and understory habitat components within treated areas. Treatments areas would be spread out spatially and temporally over approximately 5 years and may be followed with a maintenance underburning.

The Wolf Pup Project would thin and maintain at least 60% canopy cover in 140 acres of NRF habitat, retaining multi-species canopy layering with large overstory trees; a high incidence of larger trees with various deformities, large snags, and fallen trees and wood on the ground. Fifteen acres of dispersal habitat would maintain at least 40% canopy closure and approximately 0.75 miles of roadside treatment would remove narrow strips of second growth/ dispersal-size trees (8-24 inch DBH).

The recent activities (525 acres) combined with the Fire Resiliency Project (140 acres) would maintain habitat function in 565 acres of NRF and dispersal habitat, and would treat approximately 10% of CHU-64. The treatment of project units would be spaced geographically and temporally. Retaining canopy cover to support nesting, roosting and foraging, dominant trees, snags, large down wood, untreated understory areas, and spaced conifers and hardwoods in the understory would provide habitat to support the feeding, breeding, sheltering and dispersal for spotted owls, and would not contribute to reduced viability of the owl sites through reduction of available habitat utilized for breeding, nesting, feeding, sheltering, or dispersing.

Chapter 4.0 List of Preparers

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

Name	Title	Primary Responsibility
Jim Brimble	Forester	Silviculture, Compaction/Productivity
Dustin Wharton	Engineer	Transportation
Martin Lew	Ecosystem Planner	NEPA coordinator,writer
Mike Crawford	Fish Biologist	Essential Fish Habitat and Fisheries
Colleen Dulin	Hydrologist	Soils (Erosion), Hydrology
Mike Main	Fuels Specialist	Team Lead Fire Risk and Hazard, Air Quality
Merry Haydon	Archaeologist	Cultural Resources
Marlin Pose	Wildlife Biologist	Wildlife, T/E Animals
Sarah Queen-Foster	Forester	Logging Systems
Rachel Showalter	Botanist	Botany, Noxious Weeds, T/E Plants

Chapter 5.0 Public Comment and Consultation

5.1 30-Day Public Comment Period

The Fire Resiliency Project Environmental Assessment (DOI-BLM-M080 2010-030) will be made available for a 30-day public review period. Notification of the comment period will include: the publication of a legal notice in the Daily Courier, newspaper of Grants Pass, Oregon; and a letter will be mailed to those individuals, organizations, and agencies that have requested to be involved in the environmental planning and decision making processes for activities addressed in this EA.

5.2 Consultation

5.2.1 United States Fish and Wildlife Service

Medford BLM submitted a Biological Assessment (July 2010 NLAA BA) to the Fish and Wildlife Service and received a Letter of Concurrence (July 2010 NLAA LOC TAILS# 13420-2010-I-0178) stating proposed treatments are "may affect, and is not likely to adversely affect the spotted owl and spotted owl critical habitat". Although the Proposed Action does not occur in any Revised (2008) Critical Habitat Units, the same effects would also apply to spotted owls and the primary constituent elements of critical habitat in the (1992) CHU OR-64. The proposed Fire Resiliency Project Planning Area does not occur in marbled murrelet critical habitat.

5.2.2 National Marine Fisheries Service (NMFS)

Consultation for the Endangered Species Act with NMFS is not needed as the Proposed Action would not affect listed species or their habitat. No consultation is needed under the Magnuson-Stevens Fishery Conservation and Management Act as there is no adverse effect to Essential Fish Habitat for coho and chinook within the Umpqua Basin.

5.3.3 State Historical Preservation Office

Required cultural survey of the planning area was completed for the Fire Resiliency Project. The State Historic Preservation Office (SHPO) concurred that the project would have no effect to significant cultural resources referred to as Historic Properties in the National Historic Preservation Act (NHPA).

5.3.4. Native American Tribal Consultation

Fire Resiliency Project Scoping Reports were sent to local federally recognized Native American Tribes interested in Medford District Bureau of Land Management proposed projects. The Tribes take an active role in the management of their native lands and the BLM works with individual tribal governments to further identify and address Native American concerns and traditional uses of lands administered by the BLM. Follow-up phone calls to Tribes did not identify cultural resource concerns for the proposed project.

APPENDIX 1 - ALTERNATIVE DEVELOPMENT SUMMARY

Fire Resiliency Project Environmental Assessment

(DOI-BLM-M080 2010 003)

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

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

The following addresses the public's comments on Alternative Uses of Available Resources to the Fire Resiliency Project.

> **Are there any unresolved conflicts concerning alternative uses of available resources? If yes, document and go to Question #2.** *If no, document rationale and stop evaluation.*
>
> The Fire Resiliency Project was originally proposed as a 10,000 acre Resource Area wide programmatic fuels reduction project. Most of the public comments were directed at the large scale proposal. The Proposal presently includes approximately 900 acres in the Lawson and Rattlesnake drainages. The King Mountain Advocates group in Wolf Creek provided a Citizen's Alternative that the BLM considered and responded to. The following is a summary of the Citizen's Alternative:

1. ***Mature Forests and Old Growth Stands (80 years and older).*** No new road construction & no treatment.
2. ***Maturing Unmanaged Stands (up to 80 years old) in LSR.*** No new road construction & no removal of trees 8" DBH or larger. Limited to 50 feet along ridge roads for ladder fuel reduction and non-commercial thinning for improved public and firefighter safety. No treatment will occur within ¼ mile of documented NSO's (past or present) for nesting or roosting habitat. LSR & NSO habitat canopy cover no less than 80% retained. Maximum of 40% MBF will be removed. Treatment activities would be monitored by Forest Service for strict adherence to prescribed treatment and burn practices.

3. ***Plantation Stands.*** Use existing haul routes and skid trails and decompaction/ eradication of haul routes and skid trails which likely to lead to erosion after treatment. Commercial removal of trees smaller than 12" DBH to achieve 16-20 foot spacing and canopy cover of 70%. Maximum of 40% MBF will be removed. Limited to 50 foot brushing along existing roadways. Pruning of trees ≥ 7" DBH up to 9 feet height. Hand piles to be no larger than 4 feet by 6 feet in diameter.
4. ***Mature Natural Growth (up to 80 years old) in Matrix and outside Riparian Reserves.*** No new road construction. Opportunity exists to experiment with traditional and restoration thinning prescriptions. No removal of trees 16" DBH or larger. 70% canopy retention. Hundred foot fuels treatment from existing roadways to provide for improved public and firefighter safety.
5. ***Riparian Reserves associated with wetlands, streams and natural springs.*** No-treatment buffers as described in the NW Forest Plan. Increase buffer widths on steep slopes and granitic soils. All residents springs, wells or other waterways not negatively impacted by prescribed treatment.
6. ***Recommended demonstration Project.*** Two fifty acre demonstration areas (ecologically-based and traditional commercial thinning).

In further discussion with the King Mountain Advocates group, they informed us that the Lawson and Rattlesnake Areas were outside of their Area of Concern and that they would only be interested in making comments if future projects were proposed outside of Douglas County and in Josephine County, where Wolf Creek is located.

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

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

4. **Of those alternatives identified in Question #3, will such alternatives have meaningful differences in environmental effects?**

APPENDIX 2 - ENVIRONMENTAL ELEMENTS

Fire Resiliency Project Environmental Assessment

(DOI-BLM-M080-2011-010-EA)

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

Table 1. Supplemental Authorities to be Considered (BLM Handbook 1790-1 Appendix 1). This table lists some of the other authorities that may apply if the Proposed Action (Alternative 2) described in the Environmental Assessment was implemented.

Critical Element of the Human Environment	**Status** **1/ Not Present** **2/ Not Affected** **3/ Affected**	**Interdisciplinary Team Remarks** **1/ If not affected, why?** **2/ If affected, develop cause/effect statement, unit of measure to describe environmental impacts, and if applicable, design features not already identified in Appendix D of the 1995 RMP to reduce or avoid environmental harm**
Air Quality (Clean Air Act)	Not Affected	Prescribed burning would be administered in accordance with the Oregon Smoke Management Plan administered by the Oregon Department of Forestry and the regulations established by the Oregon Department of Environmental Quality. The Planning Area is not located within a Class I designated airshed or non-attainment area. The impact of smoke on air quality is expected to be localized and of short duration. Particulate matter would not be of a magnitude to harm human health, affect the environment, or result in property damage. Dust created from vehicle traffic on gravel or natural-surfaced roads, road work, and logging operations would be localized and of short duration. As such, the Proposed Action is consistent with the provisions of the Federal Clean Air Act.
Areas of Critical Environmental Concern	Not Present	There are no Areas of Critical Environmental Concern located within the Planning Area.

Table 1. Supplemental Authorities to be Considered (BLM Handbook 1790-1 Appendix 1). This table lists some of the other authorities that may apply if the Proposed Action (Alternative 2) described in the Environmental Assessment was implemented.		
Critical Element of the Human Environment	**Status** **1/ Not Present** **2/ Not Affected** **3/ Affected**	**Interdisciplinary Team Remarks** **1/ If not affected, why?** **2/ If affected, develop cause/effect statement, unit of measure to describe environmental impacts, and if applicable, design features not already identified in Appendix D of the 1995 RMP to reduce or avoid environmental harm**
Cultural, Historic, Paleontological	Not Present	Cultural resource survey of the Planning Area was conducted and one historic site was identified within the project area. The historic site was formally evaluated and determined not eligible. According to NHPA, the site does not warrant protection. If cultural resources are found during project implementation, the project would be redesigned to protect the cultural resource values present, or evaluation or mitigation procedures would be implemented based on recommendations from the Resource Area Archaeologist with concurrence from the Field Manager and State Historic Preservation Office.
Energy (Executive Order 13212)	Not Affected	The Proposed Action would have no effect on energy development, production, supply and/or distribution.
Environmental Justice (Executive Order 12898)	Not Affected	The Proposed Action is not anticipated to have disproportionately high and adverse human health or environmental effects on minority populations and low-income populations.
Prime or Unique Farm Lands	Not Present	There are no prime or unique farmlands within the Planning Area.
Flood Plains (Executive Order 11988)	Not Affected	The Proposed Action does not involve occupancy and modification of floodplains, and would not increase the risk of flood loss. As such, the Proposed Action is consistent with Executive Order 11988.
Hazardous or Solid Wastes	Not Affected	There would be no environmental effects associated with this element due to the implementation of the Best Management Practices contained in the Medford RMP and the terms/conditions of the timber sale contract.

Table 1. Supplemental Authorities to be Considered (BLM Handbook 1790-1 Appendix 1). This table lists some of the other authorities that may apply if the Proposed Action (Alternative 2) described in the Environmental Assessment was implemented.		
Critical Element of the Human Environment	**Status** **1/ Not Present** **2/ Not Affected** **3/ Affected**	**Interdisciplinary Team Remarks** **1/ If not affected, why?** **2/ If affected, develop cause/effect statement, unit of measure to describe environmental impacts, and if applicable, design features not already identified in Appendix D of the 1995 RMP to reduce or avoid environmental harm**
Invasive, Nonnative Species (Executive Order 13112)	Not Affected	Units with the Fire Resiliency Planning Area were surveyed for noxious weeds in the spring of 2009 & 2010. The Planning Area is known to have noxious weeds along many roadsides. One populations of *Rubus armenicus* (Blackberry), 4 populations of *Cirsium arvense* (Canada thistle), two populations of *Cystisus scoparius* (Scotchbroom), 2 populations of *Chondrilla juncacea* (Rush skeletonweed), and 3 populations of *Centaurea nigrescens* (Meadow knapweed) and were documented within proposed units. The Medford District RMP states that the objectives for noxious weeds are to "contain and/or reduce noxious weed infestations on BLM-administered land.(p. 92)," and "survey BLM-administered land for noxious weed infestations…(p. 93)." These RMP directions for weed management are intended to be met at a landscape level. In an effort to continue to contain and/or reduce noxious weeds on federal land, the BLM has treated many of these known weed populations within the Fire Resiliency Planning Area. Subsequent follow-up treatments are scheduled to occur in the spring of 2011. There are three main reasons why potential weed establishment is not expected to result in a detectable effect to overall ecosystem health. First, surveys indicate that a very small percentage - less than 1% of acreage within the Planning Area units - are affected by noxious weeds. Second, these sites located in units proposed for treatment have been reported during predisturbance surveys, and have received weed treatment under Medford District's *Integrated Weed Management Plan and Environmental Assessment OR-110-98-14* Third, Project Design Features (PDFs) have been established to minimize the rate at which project activities might potentially spread noxious weed seed from outside/adjacent sources. reduce the risk or rate of spread. See noxious weed specialist report in Appendix 8.

Table 1. Supplemental Authorities to be Considered (BLM Handbook 1790-1 Appendix 1). This table lists some of the other authorities that may apply if the Proposed Action (Alternative 2) described in the Environmental Assessment was implemented.		
Critical Element of the Human Environment	**Status** **1/ Not Present** **2/ Not Affected** **3/ Affected**	**Interdisciplinary Team Remarks** **1/ If not affected, why?** **2/ If affected, develop cause/effect statement, unit of measure to describe environmental impacts, and if applicable, design features not already identified in Appendix D of the 1995 RMP to reduce or avoid environmental harm**
Invasive, Nonnative Species (Executive Order 13112)	Not Affected	Seeds are spread by the wind, by animal/avian vectors, natural events, and by human activities - in particular through soil attachment to vehicles. BLM's influence over these causes of the spread of noxious weeds is limited to those caused by human activities. Additional human disturbance and traffic would increase the potential for spreading noxious weed establishment, but regardless of human activity, spread of these weeds would continue through natural forces. Thus, the BLM cannot stop the spread of noxious weeds, it may only reduce the risk or rate of spread. See noxious weed specialist report in Appendix 8.
Native American Religious Concerns	Not Affected	

Table 1. Supplemental Authorities to be Considered (BLM Handbook 1790-1 Appendix 1). This table lists some of the other authorities that may apply if the Proposed Action (Alternative 2) described in the Environmental Assessment was implemented.		
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T/E (Threatened or Endangered) Fish Species or Habitat	Not Affected (Oregon Coast coho salmon Evolutionarily Significant Unit (ESU))	Salmon are listed under the Endangered Species Act by evolutionarily significant units (ESU). An ESU is a stock of Pacific salmon that is 1) substantially reproductively isolated from other specific populations units; and 2) represents an important component in the evolutionary legacy of the species. The southern most extent of the federally listed threatened Oregon Coast (OC) coho salmon is the Umpqua Basin. A small amount of localized sediment may enter streams during log haul and existing road maintenance where roads are hydrologically connected. **OC Coho Salmon** are within the Middle Cow Creek Watershed. Thinning, yarding, landing construction and rehabilitation, temporary route construction and reconstruction (including route decommissioning), road maintenance, hauling, and activity fuel treatments would have no effect on OC coho salmon (ESA-Threatened) and coho critical habitat (CCH). The closest coho presence and CCH in streams (Bear Creek) of the Fire Resiliency Planning Area is approximately 800 ft from the closest thinning unit. The closest coho presence and CCH in streams of the Fire Resiliency Project Planning Area is approximately 25 ft away from the closest haul road segments. These two road segments represent two culverts on coho bearing streams (Rattlesnake Creek and Stevens Creek). With dry condition haul, well vegetated ditch lines, properly functioning cross drains, and existing filter strips, sediment would not be of a magnitude that would result in a measurable increase in the overall stream sediment deposition for more than 25 ft downstream within any of the stream channels. Project activities would follow all provisions of the Clean Water Act (40 CFR Subchapter D) and Department of Environmental Quality's (DEQ's) provisions for maintenance of water quality standards.

Table 1. Supplemental Authorities to be Considered (BLM Handbook 1790-1 Appendix 1). This table lists some of the other authorities that may apply if the Proposed Action (Alternative 2) described in the Environmental Assessment was implemented.		
Critical Element of the Human Environment	**Status** **1/ Not Present** **2/ Not Affected** **3/ Affected**	**Interdisciplinary Team Remarks** **1/ If not affected, why?** **2/ If affected, develop cause/effect statement, unit of measure to describe environmental impacts, and if applicable, design features not already identified in Appendix D of the 1995 RMP to reduce or avoid environmental harm**
T/E (Threatened or Endangered) Plant Species or Habitat	Not Present	Of the four federally listed plants on the Medford District (*Fritillaria gentneri, Limnanthes flocossa* ssp. *grandiflora, Arabis macdonaldiana,* and *Lomatium cookii),* only *Fritillaria gentneri* has a range which extends into the Glendale Resource Area. Final units within the Fire Resiliency Planning Area are not within the range of *F. gentneri*, as determined by the 2004 US Fish and Wildlife Service Biological Opinion. Vascular plant surveys were conducted in the springs of 2009&2010, and no *Fritillaria gentneri* populations were found. There would be no anticipated effect from the Proposed Action on any federally listed plant.

Table 1. Supplemental Authorities to be Considered (BLM Handbook 1790-1 Appendix 1). This table lists some of the other authorities that may apply if the Proposed Action (Alternative 2) described in the Environmental Assessment was implemented.		
Critical Element of the Human Environment	**Status** **1/ Not Present** **2/ Not Affected** **3/ Affected**	**Interdisciplinary Team Remarks** **1/ If not affected, why?** **2/ If affected, develop cause/effect statement, unit of measure to describe environmental impacts, and if applicable, design features not already identified in Appendix D of the 1995 RMP to reduce or avoid environmental harm**
T/E (Threatened or Endangered) Wildlife Species, Habitat and/or Designated Critical Habitat	Affected (spotted owl habitat) Not Affected Disturbance-NSO Not Affected (MAMU, habitat, disturbance) Not Affected (MAMU, habitat, disturbance)	Affected: Alternative 2 would maintain suitable and dispersal habitat for the northern spotted owl (Threatened). No thinning would occur in Recovery Action 32 (RA 32) habitat which is "substantially all of the older and more structurally complex multilayered conifer forests on Federal lands outside of MOCAs [Managed Owl Conservation Areas]" (U.S. Fish and Wildlife Service 2008b, 34). *Refer to Section 3.5 of the EA for a discussion of the affected environment and environmental effects of the alternatives related to this element of the environment.* Affected: Alternative 2 would maintain suitable and dispersal habitat in NSO 1992 critical habitat in the Planning Area, including the primary constituent elements that support dispersal. *Refer to Section 3.5 of the EA for a discussion of the affected environment and environmental effects of the alternatives related to this element of the environment.* Not Affected: Logging activities occurring during spotted owl nesting season are not expected to disturb owls because all proper Project Design Criteria distance buffers and timing restrictions during the nesting and fledging periods would be applied to proposed activities Alternative 2 does not occur within the known range of the marbled murrelet. Suitable marbled murrelet habitat including old-growth trees with multiple platforms containing moss, lichen or mistletoe (McShane et. al. 2004) may occur up to 10km east of the hemlock zone and the known range (Zone A), which includes the NW portion of the Planning Area. The proposed action would not remove or downgrade suitable murrelet habitat, and does not occur within designated marbled murrelet critical habitat.

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Critical Element of the Human Environment	**Status** **1/ Not Present** **2/ Not Affected** **3/ Affected**	**Interdisciplinary Team Remarks** **1/ If not affected, why?** **2/ If affected, develop cause/effect statement, unit of measure to describe environmental impacts, and if applicable, design features not already identified in Appendix D of the 1995 RMP to reduce or avoid environmental harm**
T/E (Threatened or Endangered) Wildlife Species, Habitat and/or Designated Critical Habitat	Affected (spotted owl habitat) Not Affected Disturbance-NSO Not Affected (MAMU, habitat, disturbance) Not Affected (MAMU, habitat, disturbance)	Affected: Alternative 2 would maintain suitable and dispersal habitat for the northern spotted owl (Threatened). No thinning would occur in Recovery Action 32 (RA 32) habitat which is "substantially all of the older and more structurally complex multilayered conifer forests on Federal lands outside of MOCAs [Managed Owl Conservation Areas]" (U.S. Fish and Wildlife Service 2008b, 34). *Refer to Section 3.5 of the EA for a discussion of the affected environment and environmental effects of the alternatives related to this element of the environment.* Affected: Alternative 2 would maintain suitable and dispersal habitat in NSO 1992 critical habitat in the Planning Area, including the primary constituent elements that support dispersal. *Refer to Section 3.5 of the EA for a discussion of the affected environment and environmental effects of the alternatives related to this element of the environment.* Not Affected: Logging activities occurring during spotted owl nesting season are not expected to disturb owls because all proper Project Design Criteria distance buffers and timing restrictions during the nesting and fledging periods would be applied to proposed activities Alternative 2 does not occur within the known range of the marbled murrelet. Suitable marbled murrelet habitat including old-growth trees with multiple platforms containing moss, lichen or mistletoe (McShane et. al. 2004) may occur up to 10km east of the hemlock zone and the known range (Zone A), which includes the NW portion of the Planning Area. The proposed action would not remove or downgrade suitable murrelet habitat, and does not occur within designated marbled murrelet critical habitat.

Table 1. Supplemental Authorities to be Considered (BLM Handbook 1790-1 Appendix 1). This table lists some of the other authorities that may apply if the Proposed Action (Alternative 2) described in the Environmental Assessment was implemented.

Critical Element of the Human Environment	Status 1/ Not Present 2/ Not Affected 3/ Affected	Interdisciplinary Team Remarks 1/ If not affected, why? 2/ If affected, develop cause/effect statement, unit of measure to describe environmental impacts, and if applicable, design features not already identified in Appendix D of the 1995 RMP to reduce or avoid environmental harm
Water Quality (Surface and Ground)	Not Affected Temperature	Temperature: A total of 7.6 miles of streams in this Planning Area do not meet ODEQ water quality standards for temperature. BLM lands would continue to be managed to attain compliance with state water quality standards and ACS objectives. Streams in this Planning Area are generally well shaded on public lands by both the mid and upper canopy streamside vegetation. Within this Planning Area, the Ecological Protection Zone (EPZ, described in Section 2.2.2 of this EA) would maintain stream temperatures by reserving all trees within the primary shade zone, and a majority of the trees within the secondary shade zone (USFS and BLM, 2005) from commercial harvest.
	Not Affected Chemical/Nutrient Contamination	Chemical/Nutrient Contamination: No herbicides or pesticides would be used as a part of this project. Hydraulic fluid and fuel lines on heavy mechanized equipment would be in proper working condition in order to minimize potential for leakage into streams. Due to Project Design Features such as no re-fueling of any equipment would occur within 150 ft of streams or stream crossings it would not be expected for the proposed activities to have any effect on chemical contamination of streams or waterbodies. Fuel treatments could increase nitrogen levels within the stream and riparian zone in the short term. These would be highly localized, low level increases and would not be of a magnitude that would have any adverse effect on macroinvertebrate populations which are the most sensitive indicators of water quality conditions.
	Affected: Sediment (hauling and road maintenance) Not Affected: Sediment (thinning, yarding, landing construction, temporary route construction and reconstruction [including associated decommissioning], haul, and fuels)	Sediment/Turbidity: A small amount of localized sediment may enter streams during hauling and road maintenance where roads are hydrologically connected. These actions would result in measurable increases in sediment for no more than 25 ft downstream of the impact point. Sediment from hauling and maintenance actions would be within the State of Oregon water quality standard of no more than a 10% increase in turbidity. All thinning, yarding, landing construction and rehabilitation, temporary route construction and reconstruction (including associated decommissioning), and activity fuels treatments would not result in measurable inputs of sediment to streams due to project design. *See section 3.4: Water Resources and Erosion for a discussion of the affected environment and environmental effects of the alternatives related to this element of the environment.*
	Affected: Sediment/ Turbidity	

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Wetlands (Executive Order 11990)	Not Affected	The Proposed Action would not result in the destruction, loss or degradation of any wetland. As such, the Proposed Action is consistent with Executive Order 11990.
Wild and Scenic Rivers	Not Present	There are no eligible, suitable, or designated Wild and Scenic Rivers within the Fire Resiliency Planning Area.
Wilderness	Not Present	

Table 2. Other Elements of the Environment. This table lists other elements of the environment which are subject to requirements specified in law, regulation, policy, or management direction and the interdisciplinary team's predicted environmental impact per element if the Proposed Action (Alternative 2) described in the Environmental Assessment was implemented.		
Other Elements of the Environment	**Status** **1/ Not Present** **2/ Not Affected** **3/ Affected**	**Interdisciplinary Team Remarks** **1/ If not affected, why?** **2/ If affected, develop cause/effect statement, unit of measure, and if applicable, design features not already identified in Appendix D of the RMP to reduce or avoid environmental harm**
Essential Fish Habitat (Magnuson-Stevens Fisheries Conservation and Management Act)	Not Affected (EFH within the Middle Cow Creek HUC 5 watershed)	Rattlesnake Creek, Stevens Creek, Cow Creek, Bear Creek, Lawson Creek, and Windy Creek within this Planning Area are designated as EFH (Essential Fish Habitat) under the Magnuson-Stevens Fishery Conservation and Management Act. Thinning, yarding, landing construction and rehabilitation, temporary route construction and reconstruction (including associated decommissioning), road maintenance, hauling, and activity fuel treatments would not adversely affect coho and Chinook salmon Essential Fish Habitat. EFH in the Fire Resiliency Planning Area is approximately 800 ft from the closest thinning unit. The closest EFH in streams of the Fire Resiliency Project Planning Area is approximately 25 ft away from the closest haul road segments. These two road segments represent two culverts on coho bearing streams (Rattlesnake Creek and Stevens Creek). With dry condition haul, well vegetated ditch lines, properly functioning cross drains, and existing filter strips, sediment would not be of a magnitude that would result in a measurable increase in the overall stream sediment deposition for more than 25 ft downstream within any of the stream channels. Project actions would follow all provisions of the Clean Water Act (40 CFR Subchapter D) and DEQ's provisions for maintenance of water quality standards.
Fire Hazard	Affected	Activity fuels created in treatment units may increase fire hazard because of the potential to produce flame lengths that exceed the fire behavior threshold in the short term due to the presence of slash until the time it is treated and/or partially decomposed, within six months to 3 years. Flame length is a method to determine fire hazard. Flame length is measured in feet and dictates fire suppression strategies (Table 5 Fire Behavior Models with the Associated Flame Lengths…) *Refer to Section 3.6 of the EA for a discussion of the affected environment and environmental effects of the alternatives related to this element of the environment.* For the fire hazard effects, Windy Creek, McCullough Creek-Cow Creek and Dads Creek-Cow Creek 6th Field Watershed were used for this analysis. Middle Creek 6th Field Watershed (26,959 acres) was considered for analysis but dropped do to .02 percent (6 acres) of the watershed is within the Planning Area or Medford District BLM.

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Other Elements of the Environment	**Status** **1/ Not Present** **2/ Not Affected** **3/ Affected**	**Interdisciplinary Team Remarks** **1/ If not affected, why?** **2/ If affected, develop cause/effect statement, unit of measure, and if applicable, design features not already identified in Appendix D of the RMP to reduce or avoid environmental harm**
Fire Risk	Not Affected	Fire risk is the probability of a fire starting, as determined by the presence of ignition sources such as lightning and human activities. New permanent road construction has the potential to increase fire risk because new roads allow for an increase in human presence by providing easier access into previously inaccessible areas. However, there is no new permanent road construction proposed in the Fire Resiliency Project and the 2 miles temporary routes to be constructed and reconstructed would be decommissioned after use.
Recreation	Not Affected	
Rural Interface Areas (RMP, Map 13)	Not Affected	Rural residents abide in the Planning Area would experience short-term noise, dust, and traffic congestion due to logging operations. These types of activities are common because of management practices occurring on private and other public lands.
Special Areas (not including ACEC)	Not Present	

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Other Elements of the Environment	**Status** **1/ Not Present** **2/ Not Affected** **3/ Affected**	**Interdisciplinary Team Remarks** **1/ If not affected, why?** **2/ If affected, develop cause/effect statement, unit of measure, and if applicable, design features not already identified in Appendix D of the RMP to reduce or avoid environmental harm**
Special Status Species (not including T/E): Fish Species/Habitat	Not Affected (Oregon Coast steelhead ESU within Middle Cow Creek HUC 5 watershed	On July 26, 2007 a new Special Status Species list went into effect (BLM 2007). This new list has two categories, Sensitive and Strategic. The former categories of Bureau Assessment and Bureau Tracking no longer exist. Fish species are listed as special status species by ESUs. See the "T/E (Threatened or Endangered) Fish Species or Habitat" section above for the definition of ESUs. The thinning, yarding, landing construction and rehabilitation, temporary route construction and reconstruction (associated road decommissioning), road maintenance, hauling, and activity fuel treatments activity would not have any adverse effect on OC Steelhead (ESA-species of Concern). The closest steelhead presence in streams of the Fire Resiliency Project Planning Area is approximately 25 ft from proposed maintenance and hauling and 800 ft from the closest thinning unit. Sediment resulting from road maintenance, and hauling activity would not be of a magnitude that would result in a measurable increase in the overall stream sediment deposition for more than 25 ft downstream within any of the stream channels. Project actions would follow all provisions of the Clean Water Act (40 CFR Subchapter D) and DEQ's provisions for maintenance of water quality standards.
	Not Present Umpqua chub	Umpqua chub are a sensitive species found in Cow Creek. No changes to Umpqua chub would occur because no measurable effects (sediment) would reach Cow Creek. The nearest project activity (road haul) would be 475 feet away from Cow Creek.

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Other Elements of the Environment	**Status** **1/ Not Present** **2/ Not Affected** **3/ Affected**	**Interdisciplinary Team Remarks** **1/ If not affected, why?** **2/ If affected, develop cause/effect statement, unit of measure, and if applicable, design features not already identified in Appendix D of the RMP to reduce or avoid environmental harm**
Special Status Species (not including T/E): Plant Species/Habitat	Not Affected	**Bureau Special Status & Survey and Manage Plants – PRESENT, NOT AFFECTED** On July 26, 2007 a new Special Status Species list went into affect (IM No. OR-2007-072). This new list has two categories, Sensitive and Strategic. The former categories of Bureau Assessment and Bureau Tracking no longer exist. Sensitive species require a pre-project clearance and management to prevent them from trending toward federal listing. There is no pre-project clearance or management required for the Strategic Species at the BLM District level, thus Strategic Species will not be analyzed in this document. The new list is effective immediately, however, if pre-project clearances have already been conducted for a project, there are no requirements to conduct pre-project clearances for newly added Bureau Sensitive Species or to address the newly added Bureau Sensitive species in the NEPA document (IM No. OR-2007-072). In addition to the new Special Status Species policy, Survey and Manage requirements have been re-instated as of December 2009. Surveys were in compliance with the 2001 Survey and Manage protocol, which requires surveys for Category A and C species. Survey and Manage protocol also requires managing known (documented) sites of Category A, B, C, and E species, managing 'high-priority' Category D species, and no site management requirement of Category F species. Vascular and nonvascular plant surveys were conducted in the fall of 2009 and the spring of 2010, respectively. Professional botanists surveyed the Planning Area units using intuitive controlled methodology, wherein areas supporting high potential habitat were surveyed more intensively; surveys were also in compliance with the 2001 Survey and Manage protocol, which requires surveys for Category A and C species. Survey and Manage protocol also requires managing known (documented) sites of Category A, B, C, and E species, managing 'high-priority' Category D species, and no site management requirement of Category F species. Surveys revealed the following new sites; (4) *Chaenotheca ferruginea* (Sensitive, S&M B), (2) *Chaenotheca furfuracea* (S&M F), (2) *Piperia elongata* (STR) and (1) *Lotus stipularis* (SEN).

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Special Status Species (not including T/E): Plant Species/Habitat (continued)		**Bureau Special Status and S&M Fungi – PRESENT, NOT AFFECTED** <u>Special Status</u> The Planning Area was not surveyed for ISSSP Sensitive fungi, as pre-disturbance surveys for Special Status fungi are not practical, nor required per BLM – Information Bulletin No. OR 2004-121, which states "If project surveys for a species were not practical under the Survey and Manage standards and guidelines (most Category B and D species), or a species' status is undetermined (Category E and F species), then surveys will not be practical or expected to occur under the Special Status/Sensitive Species policies either (USDA/USDI 2004a, p.3)." Current special status fungi were previously in the aforementioned S&M categories which did not consider surveys practical, and are therefore exempt from survey requirements. With the recent instatement the new Interagency Special Status Species policy (ISSSP), 20 species of fungi were designated as Sensitive, 9 of which have been documented on Medford District. As mentioned above, none of these species require surveys. District wide, the Medford BLM has 20 Sensitive (SEN) fungi species; 11 are suspected to occur here, while the remaining 9 have been documented. Of the 9 documented species, only one, *Phaeocollybia olivacea*, has been found in the Glendale Resource Area, approximately 12.5 air miles away from the closest unit in the Planning Area. Dispersal via spore transport and/or mycelia network is improbable, as this site and the Planning Area reside within different HUC 5 watersheds (the site is in Middle Cow Watershed). While it is possible that this project is occurring within potential habitat for some species, there is very little information available describing the *exact* habitat requirements or population biology of these species (USDA/USDI 2004c, p.148). The 2004 FEIS to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines addresses this type of incomplete and/or unavailable information (p. 108-109). However, the *2004 Record of Decision* (ROD) *to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines*, offers a broad scale prospective of this current situation in stating, "Any discussion of risk based on rarity and likelihood of disturbance must recognize that, for many species, only a small percentage of potential habitat has been surveyed.

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Special Status Species (not including T/E): Plant Species/Habitat (continued)	Not Affected	Reserves have not been surveyed to the same degree as Matrix and Adaptive Management Area land allocations. The Reserves were not surveyed because there has been little management-induced disturbance there. The vast majority of pre-disturbance surveys have been located in the Matrix and Adaptive Management Area land allocation (19 percent of the northwest Forest Plan area), so that is where many of the known sites have been found. This does not mean that a disproportionate amount of their habitat is located in Matrix. If these species are truly closely associated with late-successional or old-growth forests, we can reasonably expect that the large amount of federally managed lands in Late-Successional and Riparian Reserves which provide the most amount of this type of habitat (86 percent of currently existing late-successional forests is in reserves) would also provide, at a minimum, its proportionate share of the habitat to support populations of these species (2004 ROD to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines, p.11)." Based on the above information, the likelihood of a Sensitive fungi species in this Planning Area is very low; the likelihood of a sensitive fungi occurring within a single unit(s) encompassed in the Planning Area is even lower. The likelihood of contributing toward the need to list is not probable. <u>Survey and Manage</u> Aside from incidental Survey and Manage fungi sightings, the Planning Area was not surveyed for fungi to Survey and Manage protocol standards. For NEPA decisions signed in fiscal year 2011 and beyond for habitat-disturbing activities in old-growth forest, the 2001 S&M ROD (Forest Service and Bureau of Land Management 2001, S&G-9) gives direction to conduct equivalent effort surveys for category B fungi species if strategic surveys have not been completed for the province encompassing the project. The Survey and Manage Standards and Guides defines old growth forest as an ecosystem distinguished by old trees and related structural attributes that are usually at least 180 to 220 years old (Forest Service and Bureau of Land Management 2001, S&G-79). Strategic surveys have not been completed for category B fungi for the province containing the Fire Resiliency Planning Area, and equivalent effort surveys have not been completed as units do not exceed 180 years of age.

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Soil Productivity	Affected	Long term soil productivity is the capability of soil to sustain the inherent, natural growth potential of plants and plant communities over time. Two common types of disturbances effecting soils and associated long term productivity are compaction and displacement. Soil productivity losses resulting from compaction and displacement would be below 5%. Less than 12% of the area associated with ground based harvest systems would be compacted. *Refer to Section* 3.5 *of the EA for a discussion of the affected environment and environmental effects of the alternatives related to this element of the environment.*
Vegetation Resources	Affected	Density management treatments designed to improve the resiliency of forest stands to fire while maintaining critical owl habitat characteristics would maintain or improve conifer vigor and rates of growth. Stand densities would be reduced. There would be an increase in the availability of light, water, nutrients and growing space for trees selected to be retained. The treatment would promote the development of larger crowns on retained trees. Fewer, but larger trees throughout their diameter classes would make up these stands in the long term. *See Appendix 6- Silvicultural Prescription for further discussion.*
Soil Erodibility	Affected	Tractor and cable yarding corridors, landing construction and rehabilitation, hauling, road maintenance and use, and temporary route construction and reconstruction (including associated route decommissioning) are proposed as part of this action. These activities would result in soil compaction and disturbance that would increase erosion. Compaction would not exceed 12% within any one unit, keeping impacts from compaction within those levels assessed under the 1995 RMP. Offsite erosion and subsequent stream sedimentation is discussed in the Water Quality section of this appendix. *See Section 3.4: Water Resources and Erosion for a discussion of the affected environment and environmental effects of the alternatives related to this element of the environment.*

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Soil - mass wasting	Not Affected mass wasting	Mass wasting causes increases in erosion that may lead to stream sedimentation, and damages to road systems. The risk of large scale mass wasting within this Planning Area is low, as soils in this region are generally not highly prone to debris flows or other large scale events. Field observations and aerial photos also indicate that in the rare instances when large scale mass wasting has occurred within these sub-watersheds, the events are often a result of poorly placed roadbeds that have been built on very steep slope locations. Small slumps and slides are not uncommon in this Planning Area, and are found throughout this Planning Area, primarily at contact points between different geologic formations, or in association with roads. A geological contact zone and fault line is mapped within unit 10-1. Each unit, including unit 10-1 was closely examined on the ground for any indicators that a unit would be at an increased risk of mass wasting if stand thinning, yarding, temporary route construction, or road reconstruction were to occur. Following an on the ground examination of each unit, it was determined that the risk of mass wasting would not be elevated within any of the final proposed project units.
Visual Resources	Not Affected	The Planning Area and all proposed activities are located in VRM (Visual Resource Management) Class IV category lands. These VRM categories allow for varying amounts of modifications to the existing character of the landscape. The Proposed Action is consistent with these visual resource management objectives as stated in the Medford District Resource Management Plan (page 70).

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Water Resources (not including water quality)	Not Affected	Water quantity can be affected during timber harvest by soil compaction and increased open space. Under the Proposed Action, a total of 55.2 acres may be compacted from skid trails, landings, and temporary route construction. This would result in a net increase in sub-watershed compaction within Poorman Creek-Grave Creek of less than 0.1%. Since these watersheds are currently well below 12% watershed compaction known to result in significant changes in runoff timing and peak flows, these increases would not be of a magnitude that would result in any measurable change to the watershed hydrology. Within each unit, localized increases in surface flows at the compaction site could occur that would result in an increase in surface erosion. However due to the unaffected soils that would be left on each of these sites, these localized instances of surface erosion would infiltrate back into the unit soils. The Fire Resiliency Project would not result in the creation of any continuous areas of overstory forest canopy openings that would contribute to open space within any sub-watershed (WPN, 1999). There would be discontinuous areas less than a ½ acre in size cleared for the purpose of creating landings, and for roadway maintenance. Small canopy gaps are not sufficient to measurably alter watershed hydrology. Roadway maintenance would remove individual trees and small pockets of trees to improve road function, safety, and improved maintenance. Outside thinning units, continuous areas of treatment along roadways would be broken up by stream protection areas, and overstory trees in excess of 24 inches. Within thinning units overall canopy closure would remain above 40% and would therefore not contribute to open space (WPN, 1999). As such, the Proposed Action would result in canopy gaps that would not be large enough to result in a measurable effect on watershed hydrology, including no increase in peak flows, base flows, runoff timing, subsurface flow, or water storage. Since watershed hydrology would not be affected this project would not affect municipal or domestic water use or water rights.
Late-Successional Forest	Proposed Action is in compliance with the 15% Standard and Guideline	The Northwest Forest Plan standards and guidelines state that at least 15% of each fifth field watershed should be managed to retain late-successional patches (ROD, C-44). No regeneration harvesting is proposed and 60% canopy cover, large decadent trees, snags, down wood are retained in NSO habitat suitable for nesting, roosting and foraging. The Proposed Action is in compliance with the 15% Standard and Guideline.

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Migratory Birds Species of Concern (USFWS 2008) Bald Eagle (b*) Peregrine Falcon (b*) Rufous Hummingbird Allen's Hummingbird Olive-sided Flycatcher Willow Flycatcher (c*) Horned Lark (*strigata* ssp.) (a*) Oregon Vesper Sparrow (*affinis* ssp.) Purple Finch * (a) ESA candidate (b) ESA delisted (c) non-listed subspecies or population of T&E species	Not Affected, at a state or regional scale*	Both the U.S. Fish and Wildlife Service (2002) and Partners in Flight (Altman 1999) consider the state and regional approach a key to the conservation of migratory songbirds. The **Birds of Conservation Concern (USFWS 2008a)** identifies species, subspecies, and populations of migratory and non-migratory birds in need of additional conservation actions that are deemed to be the highest priority for conservation actions. The BCC 2008 encompasses three distinct geographic scales—North American Bird Conservation Initiative (NABCI) Bird Conservation Regions (BCRs), USFWS Regions, and National—and is primarily derived from assessment scores from three major bird conservation plans: the Partners in Flight North American Landbird Conservation Plan, the United States Shorebird Conservation Plan, and the North American Waterbird Conservation Plan. The Northwest Forest Plan as an effort in the same type of conservation planning process, which approaches management at a regional level. The proposed actions are consistent with the Northwest Forest Plan, which is also designed to provide for the conservation of other forest-related species in the range of the Northern Spotted Owl, such as these birds that may occur. Within the Northwest Forest Plan (24,455,300 federal acres), reserved/ withdrawn lands total approximately 78% of the federal land base (USDA/USDI 1994, p. 2-62:65). Not all of the reserves are in or will obtain late-successional forest conditions, but the majority is expected to contribute as suitable habitat towards migratory birds utilizing late successional habitat. In addition, Matrix lands (3,975,300 acres) representing about 16% of the federal land base, contain selected portions of the land managed to retain 15-30% in late-successional forest, which provides additional suitable habitat. *See Appendix 10 for Migratory Birds Specialist Report.*

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Survey and Manage and Special Status Species (not including T/E): Wildlife Species/Habitat	Not Present: Canada lynx, fisher Not Affected: Pond Turtle, foothill-yellow legged frog, fringed myotis Not Present	**Threatened species - Lynx**: Medford BLM was excluded from the lynx known range due to the absence of lynx habitat characteristics (involving elevation and snow depth) and lack of historic sightings. **Candidate species- Fisher**: Fishers have not been found in the Glendale Resource Area for successive years by peer-reviewed survey methods. Approximately 70 remote camera surveys were conducted to protocol (Zielinski and Kucera 1995) from 2002-2005 (12 stations within the adjacent 6th field Poorman Creek- Grave Creek subwatershed), and 20 camera surveys in 2009 in the Glendale Resource Area (4 stations within the adjacent 6th field Dads Creek-Cow Creek subwatershed), with no fisher detections. Fishers have not been observed by BLM field personnel over many successive years of field work within the Resource Area. Although it is possible that fisher may occur or disperse through the Planning Area, the absence of detections from surveys indicates use is minimal at best. Fisher would not be affected due to maintenance of large remnant trees, snags, down wood and 60% canopy cover in spotted owl suitable habitat. **Bureau Sensitive**: Pond turtles, and foothill yellow-legged frogs may occur in Rattlesnake Creek, where maintaining ACS objectives, 25' no treatment buffers, and maintaining 60% canopy cover will maintain suitable habitat and riparian conditions. . The **fringed** myotis may roost in large decadent trees and snags, which occur in some Proposed Action units and are retained to the extent possible. Some incidental snags may be felled for safety concerns but would not be of the magnitude to affect habitat abundance or distribution. **Bureau Sensitive not expected to be present** in Planning Area units: Tricolored blackbird, white-tailed kite, streaked horned lark, American peregrine falcon, bald eagle, Lewis' woodpecker, white-headed woodpecker, purple martin, black salamander, Siskiyou Mountains salamander , Oregon spotted frog, pallid bat, Townsend's big-eared bat, Oregon shoulderband snail, Chase sideband snail, travelling sideband snail, Siskiyou hesperian snail, Evening fieldslug, Franklin's bumblebee, Johnson's hairstreak, mardon skipper, coronis fritillary, Siskiyou short-horned grasshopper.

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Other wildlife	Not Affected: other species: Red Tree Vole, Goshawk, and great gray owl)	**Red Tree Vole** (RTV) is not listed as Sensitive or Strategic species for the portion of the range affected by the Planning Area in Final State Director's Special Status Species List (BLM 2008a). Red tree voles are common throughout the Planning Area. RTV sites (2001 Survey and Manage ROD) were detected in the Fire Resiliency Planning Area as a result of protocol surveys (BLM 2003) completed in January 2011. Surveys were applied to units stands over 80 years old (Pechman, see Chapter 1 of the EA). RTV habitat areas are excluded from Density Management Thinning and treatments that would modify middle and overstory trees in RTV habitat areas, per Management Recommendations (BLM 2000b) and to provide for the persistence of the species (USDA/USDI 2001). Surveys do not detect all nests, and loss of some individuals and nest structures would occur under the Proposed Action. Managing known sites, retaining large dominant trees with full crowns, and maintaining 60% canopy closure in spotted owl NRF habitat in proposed units provides habitat for these populations and across the landscape and provide for species persistence (2001 Survey and Manage ROD and Standard and Guidelines, p.4). No foreseeable projects are expected to affect the known sites; therefore, there are no cumulative effects. Fuels management has become an important part of ecosystem management and community protection on BLM lands. Piling and burning would be used to reduce excessive accumulations of fuels and reduce fire risk to red tree vole habitat. Subsequent Understory burning may be used to reduce fuel loading and vertical fuel continuity and maintain a lower fuel loading . Wildfires in stands that are managed using underburning are generally less severe, and fire suppression is more effective. fire hazard is high. Most of the Planning Area (89%) is high frequency-high severity fire regime. Burning would be conducted during a time of year when the likelihood of fire escaping into the tree canopy is lowest. Pre-treating fuels with pile burning would reduce fuel loading and reduce underburning fire intensity. Flame lengths would be approximately 1-2 feet in timber litter and 3-5 feet in timber understory, and short duration, with creeping backing downslope burns with low intensity such that direct heat and smoke is not expected to cause mortality to red tree voles in the midstory and overstory canopy.

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Other wildlife (continued)	Not Affected: other species: (continued) Del Norte salamander, pine marten,)	**Goshawks and great gray owls** are not listed as Sensitive or Strategic species in Final State Director's Special Status Species List (BLM 2008a) or USFWS Birds of Conservation Concern for BCR 5 (USFWS 2002). There are no known sites within the Proposed Action. Goshawks have been observed in the Planning Area and are likely to forage in proposed units. Light to moderate thinning would not reduce habitat suitability or would slightly improve openness for foraging. There is sufficient mix of seral stages including large trees in the Planning Area, and reserved, deferred or withdrawn habitat within Matrix to provide nesting, fledging, and foraging habitat. Viability rating would remain high and unchanged. (USDA/USDI 1994a 3&4 p.179). Great gray owls have not been observed in the Planning Area, and proposed treatments would not occur within 200 meters of meadows or agricultural lands where nesting typically occurs. Protocol surveys for great gray owls are two year surveys. The first year survey was completed in fiscal year 2010 and second year survey will be completed in 2011. **Del Norte** Surveys are not required and there are no known sites in the Fire Resiliency Planning Area; therefore, no management is required for species persistence (2001 S&M ROD and S&G p.40). **Pine marten** have been documented in the Glendale Resource Area in high-elevation conifer forest. They are thought to be present in the forested habitats across the lands administered by the Glendale Resource Area. Martens inhabit forested habitats at any elevation and would use openings in forests if there are downed logs to provide cover (Csuti, et al. 1997). They are a forest species capable of tolerating a variety of habitat types if food and cover are adequate. They prefer mature forests that contain large quantities of standing and downed snags and other coarse downed woody material, often near streams. They often use down logs for hunting and nesting. Habitat conditions and possible occurrence would not be affected for these due to maintenance of habitat elements for spotted owl habitat.

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Port-Orford-cedar	**Not Present**	**The Fire Resiliency Project is within natural range of Port-Orford-cedar (POC). A POC Risk Key Analysis was completed. No management specific to POC and POC root disease (*Phytophthora lateralis*) is required. The Proposed Action is consistent with management direction in the Port-Orford-cedar EIS (POC Risk Key on file).**

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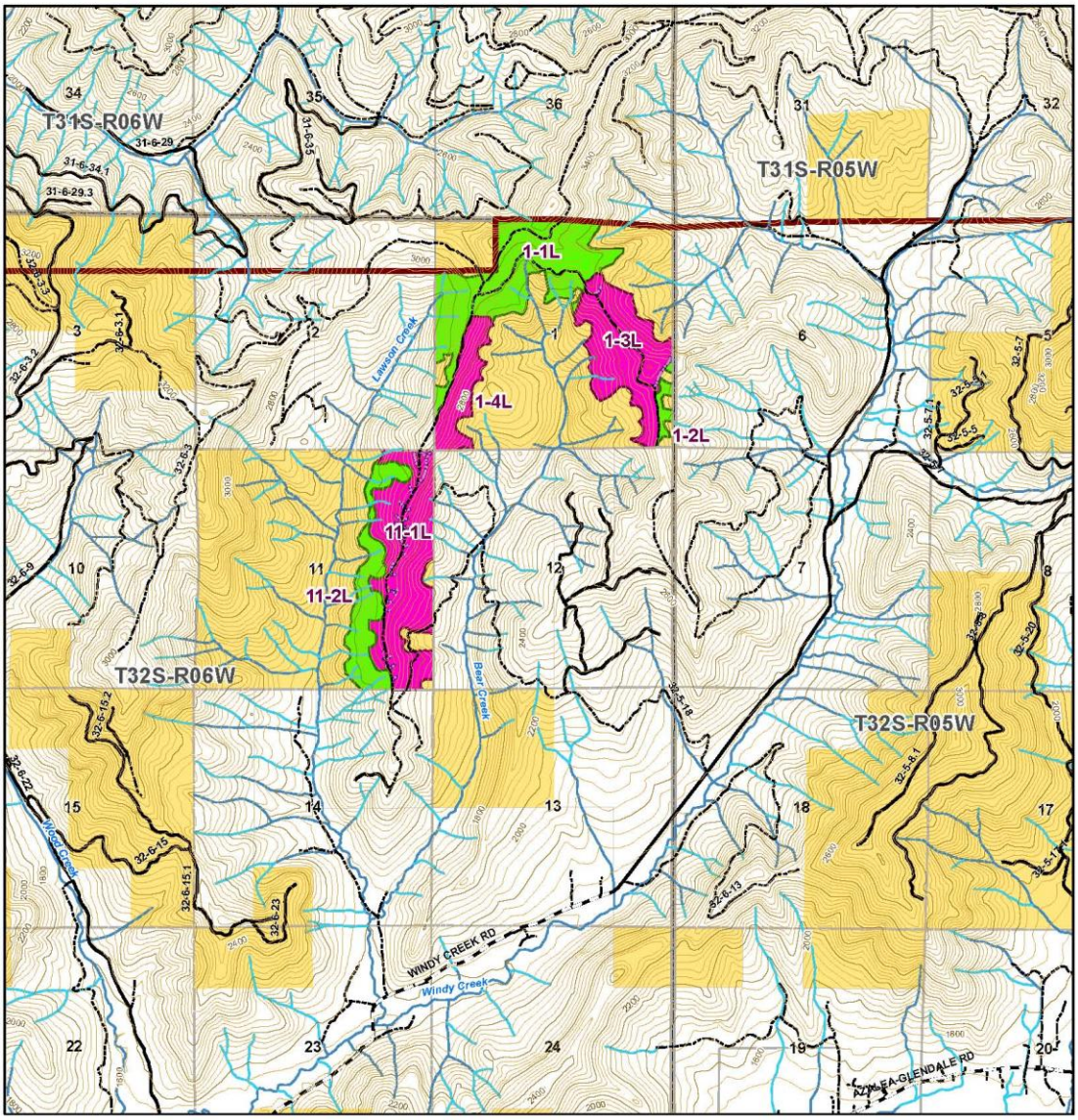
Greenhouse Gases and Carbon Storage	**Affected**	**Scientific knowledge on the interrelationship between greenhouse gas levels and climate change is rapidly changing. Substantial uncertainties and key limitations exist. Because forests store carbon, they can affect atmospheric concentrations of carbon dioxide, a greenhouse gas. Forest management can change the amount of carbon stored in a forest.** **Treatments within the Proposed Action of this project were compared to treatments in other recent projects and found to be similar. Carbon storage and carbon emissions in the proposed actions of those projects were calculated to determine the net contributions of greenhouse gases resulting from the treatments. Those carbon calculations were based on assumptions in the 2008 FEIS (USDI/BLM 2008 Appendix C) and subsequent improvements to those assumptions, as set forth in R. Hardt, personal communication, November 6, 2009 (on file in the Medford District BLM Office, and incorporated here by reference). Carbon storage was analyzed by quantifying the change in carbon storage in *live trees*, storage in forests *other than live trees* (dead wood and roots, non-tree vegetation, litter and soil organic matter), and storage in *harvested wood* products. Changes in forest ecosystem carbon over time were calculated using site specific data and the ORGANON Growth Model (Hann et al. 2007). Stand volume in cubic feet per acre per year was used to calculate tonnes of carbon stored per year. Carbon emissions (carbon dioxide) were calculated from timber harvest activities (including fuel consumption) and post-harvest fuel treatments. Net carbon storage was calculated by subtracting carbon emitted from carbon stored.** **Similar to treatments in the other projects, Fire Resiliency treatments would reduce carbon stores temporarily but would result in net increases over time. For units similar to the Fire Resiliency Understory Thinning units, growth within five years following treatment resulted in carbon storage that exceeded direct and indirect carbon emissions, resulting in a net storage of carbon compared to pretreatment conditions. For units similar to the Fire Resiliency Density Management units, growth within ten years following treatment resulted in carbon storage that exceeded direct and indirect emissions, resulting in a net storage of carbon compared to pretreatment conditions. In addition, the treatments within the Fire Resiliency Project would reduce the burning intensity of future fires which in the long-term would maintain higher carbon stores on the landscape.**

APPENDIX 3 - MAPS



Glendale Fire Resiliency Lawson Project

Legend

- Paved Roads
- Rocked Roads
- Natural Surface Roads
- Temporary Routes

Streams **

- Intermittent
- Perennial
- Resource Area Boundary

Project Unit Treatment

- DENSITY MANAGEMENT
- UNDERSTORY THINNING

- BLM Ownership
- Private Ownership

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

****Perennial and intermittent streams displayed for this map comes from the Medford District GIS corporate information. Site-specific field stream surveys have been completed for this project and were used for the analysis in the Farout Environmental Assessment. This survey information is currently being digitized to update the District's GIS corporate information and will be displayed in the Farout Timber Sale Prospectus, should this project be offered for sale.**

Miles
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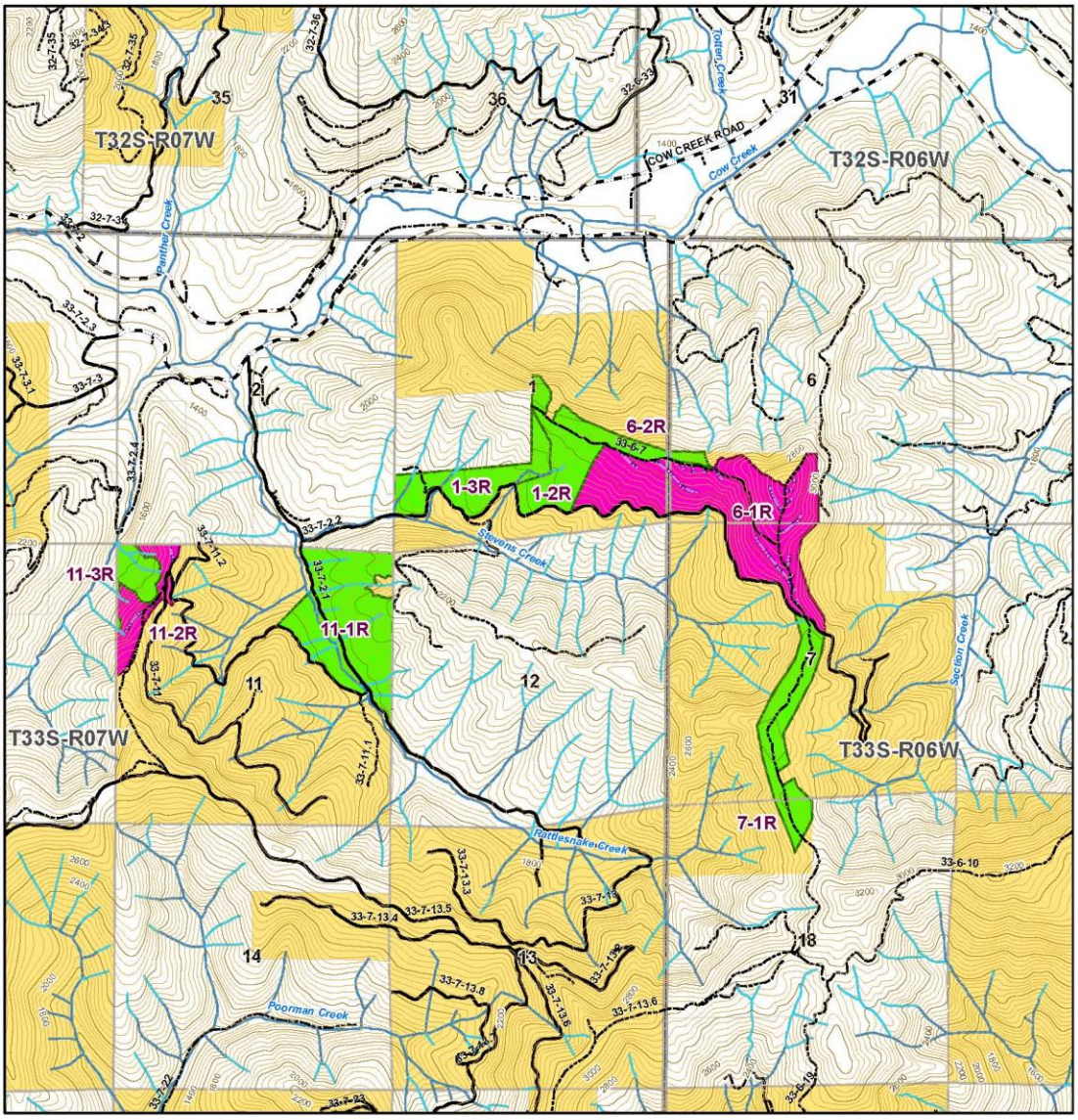
Prepared By: dassali
Current Date: 03/29/2011 11:57:08 AM



Glendale Fire Resiliency Rattlesnake Project

Legend

Paved Roads
Rocked Roads
Natural Surface Roads
Temporary Routes

Streams **
Intermittent
Perennial

Resource Area Boundary

Project Unit Treatment
DENSITY MANAGEMENT
UNDERSTORY THINNING

BLM Ownership
Private Ownership

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Miles
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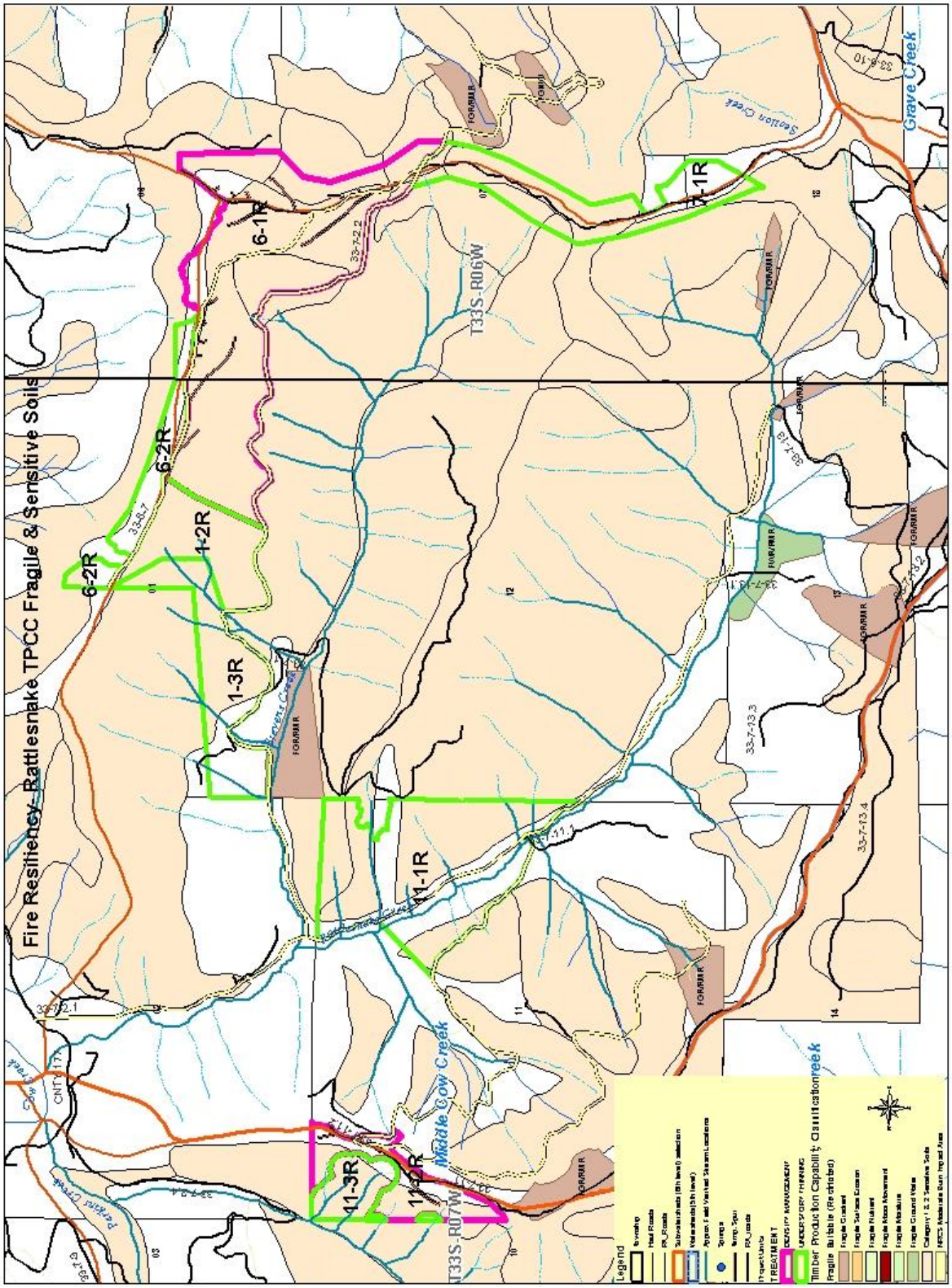
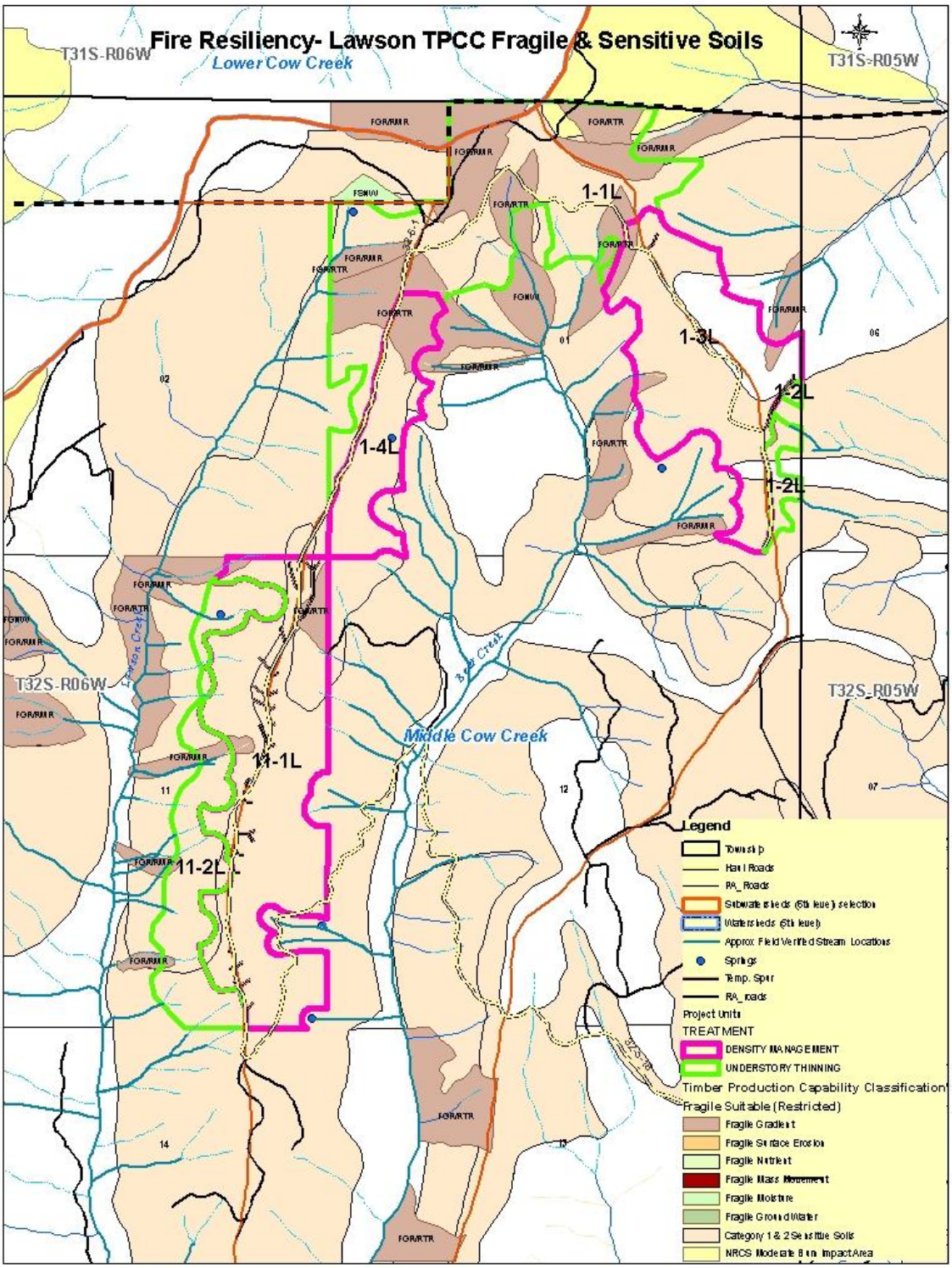
Prepared By: dassali
Current Date: 03/29/2011 11:57:08 AM


Fire Resiliency Rattlesnake TPCC Fragile & Sensitive Soils
6-2R
6-2R
1-2R
1-3R
6-1R
11-1R
11-3R
11-2R
1-1R
T33S-R06W
T33S-R07W
Middle Cow Creek
Grave Creek
Seattle Creek
Pattins Creek
FOR/MIR
Legend
Timber Production Capability Classification
Fragile Bulbible (Restricted)
Fragile Gradient
Fragile Surface Erosion
Fragile Rutted
Fragile Mass Movement
Fragile Mobility
Fragile Ground Water
Category 1 & 2 Sensitive Soils
NRCS Moderate Burn Hazard Area


Fire Resiliency- Lawson TPCC Fragile & Sensitive Soils
T31S-R06W
T31S-R05W
Lower Cow Creek
1-1L
1-3L
1-2L
1-2L
1-4L
11-1L
11-2L
T32S-R06W
T32S-R05W
Middle Cow Creek
Legend
Township
Haul Roads
RA_Roads
Subwatersheds (6th level) selection
Watersheds (5th level)
Approx Field Verified Stream Locations
Springs
Temp. Spur
RA_roads
Project Units
TREATMENT
DENSITY MANAGEMENT
UNDERSTORY THINNING
Timber Production Capability Classification
Fragile Suitable (Restricted)
Fragile Gradient
Fragile Surface Erosion
Fragile Nutrient
Fragile Mass Movement
Fragile Moisture
Fragile Ground Water
Category 1 & 2 Sensitive Soils
NRCS Moderate Burn Impact Area

APPENDIX 4 - TREATMENT UNITS

Table 10. Fire Resiliency Project-Lawson/Rattlesnake Treatment Units

Township - Range- Section	Unit #	Acres	Proposed Treatment	Minimum Canopy cover to be retained		Buffer – no cut on UT Treatments (slope distance-feet)	Existing Northern Spotted Owl Habitat	Harvest System
				upland	RR (outside of EPZ)			
32-6-1	1-1L	139	UT	---	---	25’	NRF	---
	1-2L	8	UT	---	---	25’	NRF	---
	1-3L	93	DM	60%	60%	25’	NRF	Tractor/ Cable
	1-4L	38	DM	60%	60%	25’	NRF	Cable
32-6-11	11-1L	130	DM	60%	60%	25’	NRF	Cable
	11-2L	56	UT			25’	NRF	---
33-7-1	1-2R	35	UT	---	---	25’	Non- Habitat	---
	1-3R	45	UT	---	---	25’	8-NRF, 37 DISP,	---
33-6-6 33-7-1	6-1R	146	DM	60% 40%	60% 50%	25’	132-DISP, 14 Non-Habitat	Cable/ Tractor ---
33-6-6 33-7-1	6-2R	23	UT	---	---	25’	16-NRF 7-DISP	---
33-6-7 33-6-18	7-1R	47	UT	---	---	25’	8-NRF, 22-DISP, 17-Non-abitat	---
33-7-11	11-1R	99	UT	---	---	25’	NRF	---
	11-2R	25	DM	40%	50%	25’	DISP	Cable/ Tractor
	11-3R	16	UT			25’	DISP	

Abbreviations: UT – Understory Thin DISP – Dispersal Habitat

DM – Density Management NRF -- Nesting, Roosting, & Foraging Habitat

APPENDIX 5 - ROADS

The following roads will be maintained and used for the Fire Resiliency projects.

Rattlesnake Units:

Road #	Segment	Length	Control	Surface Type
33-7-2.2	A	1.08	BLM	ROCK
33-7-2.2	B	2.50	BLM	ROCK
33-7-2.1	A	0.78	BLM	ROCK
33-7-2.1	B	0.64	BLM	ROCK
33-7-11	A	1.80	BLM	ROCK
33-7-11	B	1.19	BLM	ROCK
33-6-7	N/A	0.98	BLM	NATIV

Total: 8.97 miles

Lawson Units:

Road #	Segment	Length	Control	Surface Type
32-5-18	A	2.98	ODF	ROCK
32-5-18	B	1.01	BLM	NATIVE
32-5-18	C	0.23	BLM	NATIVE
32-5-18	D	1.18	BLM	NATIVE
32-5-18	E	0.16	BLM	NATIVE
32-5-18	F	0.38	BLM	NATIVE
32-5-18	G	0.67	BLM	NATIVE
32-5-13	N/A	0.70	ODF	ROCK

Total: 7.31 miles

APPENDIX 6 - SILVICULTURE PRESCRIPTION

Fire Resiliency Project

3/31/11

Introduction

The Fire Resiliency Project proposes density management (DM) treatments in five units (432 acres) and understory thinning (UT) treatments in nine units (466 acres) within the Windy Creek, McCollum Creek, and Dads Creek sub-watersheds (approximately 6 acres of the project lies within the Middle Creek sub-watershed). Stands in this planning area can be classified as mixed conifer and generally fall into the Douglas-fir, White Fir and Tanoak plant series. The primary conifer species in the Planning Area is Douglas-fir with lesser percentages of white fir, western hemlock, incense cedar, ponderosa pine, and sugar pine. Knobcone pine is present in some of the units. Hardwood and shrub species include, but are not limited to: Pacific madrone, California black oak, tanoak, canyon live oak, Oregon white oak, manzanita, ceanothus spp., poison oak, and California hazel.

OBJECTIVES

Land Use Allocation Objectives:

Lands proposed for treatment within the Planning Area are allocated to Matrix (including Connectivity/ Diversity Blocks) and Riparian Reserves.

Matrix Lands**:** Objectives of Matrix lands include the following:

- Produce a sustainable supply of timber and other forest commodities to provide jobs and contribute to community stability.
- Provide connectivity between Late-Successional Reserves.
- Provide habitat for a variety of organisms associated with both late-successional and younger forests.
- Provide for important ecological functions such as dispersal of organisms, carryover of some species from one stand to the next, and maintenance of ecologically valuable structural components such as down logs, snags, and large trees.
- Provide early-successional habitat.

Riparian Reserves: Objectives of this land allocation include:

- Aquatic Conservation Strategy objectives (1995 RMP p. 22-23)
- Provide habitat for terrestrial species associated with late-successional forest habitat.

- Provide dispersal habitat for the northern spotted owl.
- Implement strategies to achieve the goals established in the BLM's Riparian Wetland Initiative for the 1990s.

Treatment Objectives:

Density Management (DM): Units-- 1-3L, 1-4L, 11-1L, 6-1R, 11-2R

The objective of density management treatments within these units is to reduce stand densities so that crown bulk densities are reduced and so that the competition for light, water, nutrients and growing space is decreased on desired leave trees. The treatments would be designed to maintain nesting, roosting, and foraging habitat or dispersal habitat depending on present conditions. These treatments would enhance and promote fire resiliency across the landscape and would improve or maintain stand vigor. While wood volume would result from the treatment, production of wood volume at the present time is not a primary objective. Reduction of stand densities would also create conditions more favorable for the long-term retention of remnant Douglas-fir, pine, and incense cedar as well as retention of second growth size pine in the stands. Wood volume produced would be a by-product of the treatment. Treatment within these units would also include understory thinning.

Density management within Riparian Reserves: The objective of density management treatments within the Riparian Reserves would be that of upland treatments, to reduce crown bulk densities and to decrease competition on desired leave trees. In addition to maintaining nesting, roosting, and forage habitat or dispersal habitat, treatments would be designed to maintain riparian conditions. Riparian density management treatments would appear very similar to treatments in the upland portions of the units. Canopy cover would vary slightly though. In Riparian Reserves classified as dispersal habitat for the Northern Spotted Owl, the target would be to retain at least 50% canopy cover averaged across the treated reserve. Within areas classified as nesting, roosting and foraging habitat the target would be to retain at least 60% canopy cover.

Understory Thinning (UT): Units-- 1-1L, 1-2L, 11-2L, 1-2R, 1-3R, 6-2R, 7-1R, 11-1R, and 11-3R

The objective of understory thinning treatments would be similar to that of the density management treatments, to reduce stand densities. In these treatments, however, vegetation eight inches in diameter (dbh) and larger would not be cut. Understory thinning would focus on treating smaller (<8”dbh) material to reduce fuel ladders, lessen the likelihood of crown fire, and improve or maintain growth. Like density management treatments, understory thinning treatments would create conditions more favorable for the long-term retention of remnant Douglas-fir, pine, and incense cedar as well as retention of second growth size pine in the stands. No wood volume would be produced at this time as a result of this treatment. Treatments done within Riparian Reserves would have the same objective.

Effects of Proposed Treatments

The following tables project short-term and long-term effects of proposed treatments compared to no treatment. Projection of short-term effects has a higher degree of certainty compared to the projection of long-term effects. Stand condition and stand characteristics 11-100^{+} years into the future are highly dependent upon uncontrollable variables such as: climate stability or change, extreme weather, wildfire, future management direction, societal pressures, available funding for follow-up treatments and random events.

Vegetation Effects – Short Term (0-10 years)

Stand Condition	No Treatment	Treatments under the Proposed Action	
		Density Management	Understory Thinning
Amount of vegetation	No change	Decrease	Decrease
Crown Bulk Density	No change	Decrease	Decrease
Fuel Ladders	No change	Decrease	Decrease
Vigor of Residual Trees	No change to decrease	No change to increase	No change to increase in areas of larger trees. No change to increase in areas of trees less than 8" dbh
Growth Rate	No change to decrease	No change to increase	No change to slight increase in areas of larger trees. No change to increase in areas of trees less than 8" dbh
Live Crown Ratio	No change to decrease	No change to increase	No change to increase
Conifer species	No change current spp. to slight decrease	No change in current species to increased species present	No change in current species to increased species present
Hardwood Species	No change to decrease	No change to increase	No change
Shrubs/Shrubs/ Forbs	Decrease	No change to increase as more light gets to the understory	No change in current spp. to increase
Snags	No change in number to increase due to mortality	No change in number to slight decrease as some almost dead trees may be removed	No change to slight decrease as competition around remnants would be reduced
Coarse Woody Debris	Remain the same to increase	Remain the same to slight increase	Remain the same to slight increase
Branching	Continued slow loss of lower limbs	Retention of existing lower limbs	Retention of existing lower limbs to reduction
Stability	No change to decrease	No change to potential rapid decrease where height/ diameter ratios are currently high. While some loss may occur within treated units	No change to slight decrease

		little - none is expected.	
Ability to Respond to Future Treatments	No change to decrease	Increase, however due to low Live Crown Ratios (LCR) in a few areas, some retained trees probably won't respond much if at all in the short-term	No change to slight increase

Vegetation Effects – Long Term (11+ years)

Stand Condition	No Treatment	Treatments under the Proposed Action	
		Density Management	Understory Thinning
Amount of vegetation	No change	Initial decrease followed by return to near pre-treatment levels as regrowth occurs	Initial decrease followed by return to near pre-treatment levels as regrowth occurs
Crown Bulk Density	No change	Initial decrease followed by return to near pre-treatment levels as regrowth occurs	Initial decrease followed by return to near pre-treatment levels as regrowth occurs
Fuel Ladders	No change	Decrease	Decrease
Vigor of Residual Trees	Decrease	No change to increase	Slight increase to increase
Growth Rate	Decrease	No change to increase	No change to increase
Live Crown Ratio	Decrease	Increase	No change to increase
Conifer Species	No change current spp. to slight decrease	No change to increase	No change to slight increase
Hardwood Species	No change to decrease	Remain the same to increase then decrease as canopy closes	No change to slight increase
Shrubs/Shrubs/ Forbs	Decrease	Increase then decrease as canopy closes	No change to increase
Snags	Increase due to mortality, smaller diameters	Decrease in numbers, increase in size	Decrease in numbers, increase in size
Coarse Woody Debris	Increase, but small diameter	No change to slight increase	No change to slight increase
Branching	Continued loss of lower limbs	Retention of lower limbs until canopy closes, some development /retention of	Retention of limbs present, possible development /retention of large branches

		large branches	
Stability	Decrease	Increase (after potential short-term decreases)	Increase (after potential short-term decreases)
Ability to Respond to Future Treatments	Decrease	Increase	No change to increase

STAND DESCRIPTIONS / ANALYSES / RECOMMENDED TREATMENTS

UNIT: 1-1L

T.32S. R.6W. section 1

Stand Description: Considerable variability exists within unit 1-1L. The western and northern portions of the unit consist of pole and small sawtimber size Douglas-fir generally 8-20" dbh mixed with smaller Douglas-fir, madrone, and canyon live oak. The eastern portion of the unit consists primarily of pole size and larger Douglas-fir with little or no understory. Parts of the unit consist of primarily hardwoods (canyon live oak, madrone, and tree-form chinquapin) and shrubs. Big leaf maple and white fir are present. Scattered large remnant Douglas-fir, pine, and incense cedar are also present. Portions of the unit have been previously entered.

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

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

Prevention/Avoidance Strategies: Long-term maintenance of canopy cover would slow/prevent the establishment and growth of competitive vegetation. Periodic underburning or other fuels treatment would retard the development of ladder fuels.

Recommended Treatment: An **understory thinning (UT)** treatment that reduces stand densities from below is the recommended treatment for **unit 1-1L**. Space conifers less than eight inches in diameter (dbh) on a 20'x20' spacing (± 4' to allow for tree selection). Space off of conifers eight inches dbh and greater. Order of conifer species preference is ponderosa and sugar pine, incense cedar, Douglas-fir, and white fir. Form, vigor and ability to become a dominant or co-dominant tree outweigh species. Space tree-form hardwoods less than eight inches dbh on a 40'x40' spacing (± 10'to allow for tree selection). Space off of hardwoods eight inches dbh and greater. On stump sprouted hardwoods treat so as to retain only one or two main stems. Select madrone and chinquapin over tanoak. Slash shrubs. Cut all vegetation less than eight inches dbh within a radius of forty feet around dominant and co-dominant pine. Cut all vegetation less than eight inches dbh within a radius of thirty feet around dominant and co-dominant cedar. Within the pole-sawtimber size timber in the eastern part of the unit, fall at a rate of not more than seven trees per acre (approx. 75' spacing), cull white fir and Douglas-fir when within 20' of viable leave trees. Evaluate for need to treat fuels. Handpile and burn piles as appropriate. Evaluate 5-7 years after treatment for need for fuels treatment maintenance. Cut, handpile, burn piles or underburn if needed.

Silvicultural Options Considered: A density management treatment in portions of the unit that removed merchantable material was considered but was rejected at this time due to lack of access from the Lawson Creek road system.

UNIT: 1-2L

T.32S. R.6W. section 1

Stand Description: Unit 1-2L is a previously entered unit consisting of a mix of second growth Douglas-fir, white fir and incense cedar. Diameters are generally 6-20" dbh with some larger remnant conifers. Although the understory is relatively open, some madrone and canyon live oak are present.

Analysis: This unit is designated as Matrix/Connectivity. Stand does not currently meet RMP guidelines for regeneration harvest. Although some areas could yield a commercial product (small poles /posts), it is questionable whether or not timber harvest at this time would be economical. Fuel loadings are a concern. The unit is currently categorized as nesting, roosting, and foraging habitat for the northern spotted owl (NSO).

Desired Future Condition/Results: The desired future condition resulting from this action would be a stand that had stand densities reduced and maintained constituent elements for nesting, roosting, and foraging habitat. Reduction of densities would result in reduced competition on retained trees. Growth rates of the remaining trees would be maintained or would increase. Mortality of remaining conifers and hardwoods would decrease. Hardwoods would remain within the stand for a longer period of time. Ladder fuels within the stand would also be reduced. Slash would be piled and burned. In the long-term, stand vigor would be maintained. Crowns of existing trees would become fuller.

Prevention/Avoidance Strategies: Long-term maintenance of canopy cover would slow/prevent the establishment and growth of competitive vegetation. Periodic underburning or other fuels treatment would retard the development of ladder fuels.

Recommended Treatment: An **understory thinning (UT)** treatment that reduces stand densities from below is the recommended treatment for **unit 1-2L**. Space conifers less than eight inches in diameter (dbh) on a 20'x20' spacing (± 4' to allow for tree selection). Space off of conifers eight inches dbh and greater. Order of conifer species preference is ponderosa and sugar pine, incense cedar, Douglas-fir, and white fir. Form, vigor and ability to become a dominant or co-dominant tree outweigh species. Space tree-form hardwoods less than eight inches dbh on a 40'x40' spacing (± 10'to allow for tree selection). Space off of hardwoods eight inches dbh and greater. On stump sprouted hardwoods treat so as to retain only one or two main stems. Select madrone and chinquapin over tanoak. Slash shrubs. Cut all vegetation less than eight inches dbh within a radius of forty feet around dominant and co-dominant pine. Cut all vegetation less than eight inches dbh within a radius of thirty feet around dominant and co-dominant cedar. Evaluate for need to treat fuels. Handpile and burn piles as appropriate. Evaluate 5-7 years after treatment for need for fuels treatment maintenance. Cut, handpile, burn piles or underburn if needed.

Silvicultural Options Considered: none

UNITS: 1-3L, 1-4L

T.32S. R.6W. section 25

Stand Description: These units consist of second growth Douglas-fir mixed with white fir, incense cedar, and scattered sugar pine. Diameters generally range from 8”-32” dbh. Some larger remnant pine and incense cedar are present. Considerable white fir exists above the road in unit 1-3L. Canopy cover is 50-70% for the majority of the unit. Canopy cover is greater in places. These units have been previously entered, once an estimated 70-80 years ago and again as part of the McLawson timber sale. Live crown ratios are 20%-45% throughout the stand with many suppressed trees and broken tops or poorly formed trees. The north-eastern portion of 1-1 has some scattered western hemlock. Basal area in the stand is 200-300 ft^2. The understory consists of Pacific madrone, chinquapin, alder and Douglas-fir regeneration. A few areas on the southerly aspects have canyon live oak and there is rhododendron. The ground cover consists of salal, ferns, dwarf Oregon grape, hazel, rattlesnake plantain, and tanoak. Many smaller diameter hardwoods have been shaded out and are dead.

Analysis: These units are designated as Matrix/Connectivity. Stand does not currently meet RMP guidelines for regeneration harvest. The unit is currently categorized as nesting, roosting, and foraging habitat for the northern spotted owl (NSO). Portions of the units have high levels of canopy cover. Removal of some canopy would separate crowns and reduce crown bulk density.

Desired Future Condition/Results: The desired future condition resulting from this action would, in the short-term, be a stand that had an average of at least 60% canopy cover retained across each unit and that constituent elements for nesting, roosting, and foraging habitat were maintained. Crown bulk densities would be reduced. There would be space between the crowns of many retained trees. Reduction of the canopy to this level would result in reduced competition on retained trees. Remnant pine and cedar would remain in the stand for a longer time. Vigor and growth rates of the remaining trees would increase where the stand was opened and would be maintained where the stand is currently more open. Mortality of remaining conifers and hardwoods would decrease. In the long-term, growth rates and stand vigor would be maintained. Crowns of existing trees would become fuller and canopy cover would increase from post-harvest levels. Eventually canopy cover would return to near pretreatment levels. However, instead consisting of numerous smaller trees, the canopy would be formed from the crowns of fewer but larger trees. Large hardwoods would be part of the stand.

Prevention/Avoidance Strategies: Long-term maintenance of canopy cover would slow/prevent the establishment and growth of competitive vegetation. Periodic underburning or other fuels treatment would retard the development of ladder fuels.

Recommended Treatment: A **density management (DM)** treatment that thins from below is the recommended treatment for **units 1-3L and 1-4L**. Mark to retain an average of at least 60% canopy cover across each unit. This canopy cover is to be achieved by retaining: a) an average basal area of 160ft^2 of vigorous, well-formed conifers 8” dbh and larger; plus b) conifers less than 8” dbh; and c) hardwoods. (Conifer crown condition and lack of conifers less than 8”dbh and hardwoods may require that additional merchantable conifers be retained to meet the minimum 60% canopy cover requirement.) As part of the 160ft^2 of basal area, retain remnant pine and cedar. Remove co-dominant and smaller Douglas-fir and white fir, hardwoods, and shrubs within a radius of forty feet around dominant and co-dominant pine. Remove co-dominant and smaller Douglas-fir and white fir, hardwoods, and shrubs within a radius of thirty feet around dominant and co-dominant cedar. Thin hardwoods. In areas with understory vegetation, do an understory thin (UT) treatment. Evaluate for need to treat fuels. Handpile and burn piles as appropriate. Evaluate 5-7 years after treatment for need for fuels treatment maintenance. Cut, handpile, burn piles or underburn if needed.

Silvicultural Options Considered: An understory thin (UT) treatment by itself was considered but was rejected as crowns of dominant and co-dominant trees would not be spaced and crown bulk density would not be as reduced. Reduction of competitive vegetation around remnant conifers would also not occur to the same extent as with a density management treatment.

UNITS: 11-1L, 11-2L

T.32S. R.6W. section 11

Stand Description: These units consist of variety of stand types. Portions are second growth Douglas-fir mixed with incense cedar, ponderosa pine, sugar pine, and some white fir. Diameters generally range from 12-20" dbh. Some larger remnant pine and incense cedar are present. Much of this stand type lies to the east of road 32-5-18 and much of it received a commercial thinning treatment as part of the McLawson timber sale. Canopy cover, as in other previously thinned areas, is variable but is generally 50-70%. Within previously thinned areas, there is varying amounts of understory vegetation. Unthinned areas elsewhere within these units are a mix of pole-size and smaller Douglas-fir, incense cedar, ponderosa pine, madrone, chinquapin, canyon live oak, and both tree- and shrub-forms of tanoak. Conifers have a similar range of diameters but those eight inches dbh and greater are less frequent. Much of these areas are overstocked with advanced Douglas-fir regeneration 1-4" dbh and hardwoods. Areas where the overstory canopy is almost entirely hardwoods are present. The southern portion of unit 11-1L is one such area. This area has had a fuels treatment. It consists of 6-14"dbh madrone mixed with widely spaced Douglas-fir, pine, and incense cedar. The units (as mapped) contain two small regeneration harvest units from the McLawson timber sale (units #4 and #5).

Analysis: These units are designated as Matrix. Units do not currently meet RMP guidelines for regeneration harvest. The units are currently categorized as nesting, roosting, and foraging habitat for the northern spotted owl (NSO). Portions of the units have high levels of canopy cover. Removal of some canopy would separate crowns and reduce crown bulk density.

Desired Future Condition/Results: The desired future condition resulting from this action would, in the short-term, be a stand that had an average of at least 60% canopy cover retained across each unit and that constituent elements for nesting, roosting, and foraging habitat were maintained. Crown bulk densities would be reduced. There would be space between the crowns of many retained trees. Reduction of the canopy to this level would result in reduced competition on retained trees. Remnant pine and cedar would remain in the stand for a longer time. Vigor and growth rates of the remaining trees would increase where the stand was opened and would be maintained where the stand is currently more open. Mortality of remaining conifers and hardwoods would decrease. In the long-term, growth rates and stand vigor would be maintained. Crowns of existing trees would become fuller and canopy cover would increase from post-harvest levels. Eventually canopy cover would return to near pretreatment levels. However, instead consisting of numerous smaller trees, the canopy would be formed from the crowns of fewer but larger trees. Large hardwoods would be part of the stand.

Prevention/Avoidance Strategies: Long-term maintenance of canopy cover would slow/prevent the establishment and growth of competitive vegetation. Periodic underburning or other fuels treatment would retard the development of ladder fuels.

Recommended Treatment: A **density management (DM)** treatment that thins from below is the recommended treatment for **unit 11-1L**. Mark to retain an average of at least 60% canopy cover across the unit. This canopy cover is to be achieved by retaining: a) an average basal area of 160ft^2 of vigorous, well-formed conifers 8" dbh and larger; plus b) conifers less than 8" dbh; and c) hardwoods. (Conifer crown condition and lack of conifers less than 8"dbh and hardwoods may require that additional merchantable conifers be retained to meet the minimum 60% canopy cover requirement.) As part of the 160ft^2 of basal area, retain remnant pine and cedar. Remove co-dominant and smaller Douglas-fir and white fir, hardwoods, and shrubs within a radius of forty feet around dominant and co-dominant pine. Remove co-dominant and smaller Douglas-fir and white fir, hardwoods, and shrubs within a radius of thirty feet around dominant and co-dominant cedar. Portions of the previous fuels treatment in the southern portion of 11-1L, however, have a considerable number of pole-size incense cedar. In these areas, retain dominant and co-dominant Douglas-fir that is around the incense cedar. Thin hardwoods. In areas with understory vegetation, do an understory thin (UT) treatment. Evaluate for need to treat fuels. Handpile and burn piles as appropriate. Evaluate 5-7 years after treatment for need for fuels treatment maintenance. Cut, handpile, burn piles or underburn if needed.

An **understory thinning (UT)** treatment that reduces stand densities from below is the recommended treatment for **unit 11-2L**. Space conifers less than eight inches in diameter (dbh) on a 20'x20' spacing (± 4' to allow for tree selection). Space off of conifers eight inches dbh and greater. Order of conifer species preference is ponderosa and sugar pine, incense cedar, Douglas-fir, and white fir. Form, vigor and ability to become a dominant or co-dominant tree outweigh species. Space tree-form hardwoods less than eight inches dbh on a 40'x40' spacing (± 10'to allow for tree selection). Space off of hardwoods eight inches dbh and greater. On stump sprouted hardwoods treat so as to retain only one or two main stems. Select madrone and chinquapin over tanoak. Slash shrubs. Cut all vegetation less than eight inches dbh within a radius of forty feet around dominant and co-dominant pine. Cut all vegetation less than eight inches dbh within a radius of thirty feet around dominant and co-dominant cedar. Evaluate for need to treat fuels. Handpile and burn piles as appropriate. Evaluate 5-7 years after treatment for need for fuels treatment maintenance. Cut, handpile, burn piles or underburn if needed.

McLawson #4 and #5 units: Treat as part of the Forest Development program. If slash from cutting treatments is a concern, handpile slash and burn piles.

Silvicultural Options Considered: An understory thin (UT) treatment by itself was considered but was rejected as crowns of dominant and co-dominant trees would not be spaced and crown bulk density would not be as reduced. Reduction of competitive vegetation around remnant conifers would also not occur to the same extent as with a density management treatment.

UNIT: 1-2R

T.33S. R.7W. section 1

Stand Description: This unit is the 1980s "start-over" unit Rattledell #2. The unit was converted from a stand of hardwoods and has been intensively managed over the last 20 years. It is currently a young managed stand of 2-6" dbh Douglas-fir and ponderosa pine mixed with resprouting tanoak and madrone. In some places sprouts are 6-10' tall. Natural knobcone pine is present in portions of the unit.

Analysis: The unit is designated as Matrix/Connectivity. A considerable investment of time and money has been made so that target stocking could be established on this site. Conifers have not yet shaded out sprouting hardwoods. Unit contains two LIM test sites (metal pins) that are no longer being followed. This unit is neither nesting, roosting, and foraging, nor dispersal habitat.

Desired Future Condition/Results: The desired future condition resulting from this action would, in the short-term, be a stand that continued to be stocked at target levels. In the long-term the desired future condition would be a stand that had a wide range of management possibilities that include timber production and wildlife habitat.

Prevention/Avoidance Strategies: Development of canopy cover would slow/prevent the establishment and growth of competitive vegetation.

Recommended Treatment: An **understory thinning (UT)** treatment that reduces stand densities (primarily hardwood, shrubs, and knobcone pine) is the recommended treatment for **unit 1-2R**. Slash resprouting hardwoods, shrubs, and knobcone pine. Space Douglas-fir and ponderosa pine 14'x14', favoring vigorous, well-formed ponderosa pine. Prune conifers twelve feet tall and greater. Treat through test sites avoiding metal pins. Evaluate for need to treat fuels. Handpile and burn piles as appropriate. Evaluate 5-7 years after treatment for need for fuels treatment maintenance. Cut, handpile, and burn piles if needed.

Silvicultural Options Considered: Deferring treatment to a later date was considered but was rejected. The unit, especially along roads 33-6-7 and 33-7-2.2, comprises a large portion of the project within Stevens Creek.

UNIT: 1-3R

T.33S. R.7W. section 1

Stand Description: Unit 1-3R contains several different stand types. Eastern portions of the unit contain shrub- and tree-form tanoak and chinquapin, 4-8"dbh madrone, 6-10"dbh knobcone pine and limited amounts of 1-4"dbh Douglas-fir, sugar pine, and ponderosa pine. Understory shrubs are dense. Whitethorn ceanothus is present. The knobcone pine is generally of poor condition and vigor. Much of it has collapsed. Areas of almost all knobcone pine are present. The central portion of the unit consists of an area of 6-24"dbh Douglas-fir mixed with scattered large 16-24" dbh madrone. The understory is relatively open. Some tree-form chinquapin and tanoak is present as well as some shrub-form tanoak. To the west the unit changes to a stand of shrub- and tree-form tanoak mixed with tree-form chinquapin and scattered 12-16"dbh knobcone and Douglas-fir. The western-most portion of the unit is nesting, roosting, and foraging habitat with large Douglas-fir.

Analysis: This unit is designated as Matrix/Connectivity. Stand does not currently meet RMP guidelines for regeneration harvest. The unit is contains areas that are currently categorized as nesting, roosting, and foraging habitat for the northern spotted owl (NSO) as well as areas categorized as dispersal habitat. Areas of non-NSO habitat are present. Portions of the units have high levels of canopy cover. Removal of some canopy would separate crowns and reduce crown bulk density.

Desired Future Condition/Results: The desired future condition for this unit would be in the short-term a unit that maintained nesting, roosting, and foraging, and dispersal habitat where it currently exists. Fuels and especially ladder fuels within the unit would be reduced. Knobcone pine would be reduced. Stand densities would be reduced and selected conifers would be released. In the long-term the desired future condition would be a stand of Douglas-fir mixed with ponderosa, sugar pine, and scattered large hardwoods. Knobcone pine would be reduced from a major component in parts of the unit to a minor component.

Prevention/Avoidance Strategies: Long-term maintenance of canopy cover would slow/prevent the establishment and growth of competitive vegetation. Periodic underburning or other fuels treatment would retard the development of ladder fuels.

Recommended Treatment: An **understory thinning (UT)** treatment that reduces stand densities from below is the recommended treatment for **unit 1-3R**. Space conifers less than eight inches in diameter (dbh) on a 16-20x' spacing (± 4' to allow for tree selection). Space off of conifers (except knobcone pine) eight inches dbh and greater. Order of conifer species preference is ponderosa and sugar pine, incense cedar, Douglas-fir, and white fir. Form, vigor and ability to become a dominant or co-dominant tree outweigh species. Retain knobcone pine only when other conifer species are not present. Space tree-form hardwoods less than eight inches dbh on a 40'x40' spacing (± 10'to allow for tree selection). Space off of hardwoods eight inches dbh and greater. On stump sprouted hardwoods treat so as to retain only one or two main stems. Select madrone and chinquapin over tanoak. Slash shrubs. Cut all vegetation less than eight inches dbh within a radius of forty feet around dominant and co-dominant pine. Cut all vegetation less than eight inches dbh within a radius of thirty feet around dominant and co-dominant cedar. Within areas of knobcone pine, fall at a rate of not more than seven trees per acre (approx. 75' spacing), collapsing and cull knobcone 8-12" dbh when within 20' of viable leave trees. Evaluate for need to treat fuels. Handpile and burn piles as appropriate. Evaluate 5-7 years after treatment for need for fuels treatment maintenance. Cut, handpile, burn piles or underburn if needed.

Silvicultural Options Considered: A "start-over" treatment is an option that could be considered for most of the unit. It was rejected as it did not meet the purpose and need of the project.

UNIT: 6-2R

T.33S. R.7W. section 1, T.33S. R.6W. section 6

Stand Description: Unit 6-2R is a younger portion of a larger Operations Inventory (OI) unit that is situated along the ridge separating Stevens Creek from Cow Creek. The unit is a mix of advanced Douglas-fir regeneration 2-8" dbh, shrub- and tree- form tanoak, madrone and chinquapin. Larger 10-20" dbh Douglas-fir and ponderosa pine are present.

Analysis: The western 4/5th of the unit is designated as Matrix/Connectivity. The eastern 1/5th is designated as Matrix. Unit is overstocked and along a ridge.

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

Prevention/Avoidance Strategies: Long-term maintenance of canopy cover would slow/prevent the establishment and growth of competitive vegetation. Periodic underburning or other fuels treatment would retard the development of ladder fuels.

Recommended Treatment: An **understory thinning (UT)** treatment that reduces stand densities from below is the recommended treatment for **unit 6-2R**. Space conifers less than eight inches in diameter (dbh) on a 20'x20' spacing (± 4' to allow for tree selection). Space off of conifers (except knobcone pine) eight inches dbh and greater. Order of conifer species preference is ponderosa and sugar pine, incense cedar, Douglas-fir, and white fir. Form, vigor and ability to become a dominant or co-dominant tree outweigh species. Retain knobcone pine only when other conifer species are not present. Space tree-form hardwoods less than eight inches dbh on a 40'x40' spacing (± 10'to allow for tree selection). Space off of hardwoods eight inches dbh and greater. On stump sprouted hardwoods treat so as to retain only one or two main stems. Select madrone and chinquapin over tanoak. Slash shrubs. Cut all vegetation less than eight inches dbh within a radius of forty feet around dominant and co-dominant pine. Cut all vegetation less than eight inches dbh within a radius of thirty feet around dominant and co-dominant cedar. Evaluate for need to treat fuels. Handpile and burn piles as appropriate. Evaluate 5-7 years after treatment for need for fuels treatment maintenance. Cut, handpile, burn piles or underburn if needed.

Silvicultural Options Considered: No treatment at this time was considered but was rejected due to the strategic location of the unit.

UNIT: 6-1R

T.33S. R.6W. section 6, T.33S. R.7W. sections 1, 7

Stand Description: Unit 6-1R is unit comprised of several stands and stand types. The unit and much of the Steven's Creek drainage were burned by wildfire in the early 1950s. What returned were stands that were a mix of madrone, tanoak, chinquapin, ceanothus species, knobcone pine and scattered remnant ponderosa pine, sugar pine, and Douglas-fir. Shrubs within parts of the drainage were almost impenetrable. In the years since the burn, much of the drainage has been actively managed. Almost all of unit 6-1R has had some treatment done on it since the early 1980s. A portion of the unit was a hardwood conversion that now contains 3-6"dbh Douglas-fir and ponderosa pine. A portion of the unit was logged in the 1960s and currently contains almost merchantable (8"dbh) Douglas-fir. Portions of the unit are younger managed stands where conifers have just recently become established. While Douglas-fir is the principle conifer, ponderosa pine and sugar pine are present. Much of the unit received a fuels reduction treatment about ten years ago. This area is variable with some acres being stocked with 6-10"+ dbh Douglas-fir and ponderosa pine, some acres being stocked almost entirely with 8-12"dbh madrone, and some acres containing a mix of conifer regeneration, conifer poles and hardwoods. Douglas-fir and ponderosa pine remnants 24-36"+dbh are scattered throughout the unit and in some places are showing signs of decline. Sprouting hardwoods (sometimes 6-10' tall) consisting of tanoak, chinquapin, and madrone can be found throughout the unit.

While most of the unit has had some form of forest management treatment, there are a couple of areas which have had none other than some salvage or incidental cutting. Much of the area upslope of road 33-6-7 in the SE1/4 of SW1/4 of section 1is one of the areas. This area consists of mix of Douglas-fir and pine poles, advanced conifer regeneration, tree-form and shrub-form tanoak, chinquapin, madrone, and Douglas-fir and pine remnants. The other area is that which is east of the saddle (junction of roads 33-7-2.2 and 33-6-7. This area is a younger portion of a larger and older Operations Inventory (OI) unit. This area contains tree-form and shrub-form tanoak and limited amounts of Douglas-fir regeneration.

Analysis: The unit is designated as Matrix/Connectivity. A considerable investment of time and money has been made to reduce fuels, control competing vegetation and established conifers within this unit. This unit contains nesting, roosting, and foraging, habitat; dispersal habitat; and areas that are neither. Portions of the unit are situated along a ridge and at a saddle.

Desired Future Condition/Results: The desired future condition resulting from this action would vary depending on where in unit 6-1R a person was. In the young managed stands the treatment would focus on reducing shrubs and hardwoods. Competition on young conifers would be reduced so that their establishment and growth would be promoted. The time spent in the stand initiation phase of development would be reduced. In older and in "wild" portions of the unit the treatment would focus on reducing shrubs and hardwoods as well as reducing competition to desired leave conifers. Throughout the unit stand densities would be reduced which would result in reduced competition on retained trees. Conifer remnants would remain and their vigor would improve. Remnant conifers would remain in the unit. Growth rates of the remaining trees would be maintained or would increase. Ladder fuels within the unit would also be reduced. Slash in some areas would be piled and burned. In the long-term, vigor would be maintained. Crowns of existing trees would become fuller and canopy cover would increase from post treatment levels. Eventually canopy cover would return to near pretreatment levels. However, instead consisting of numerous smaller trees, the canopy would be formed from the crowns of fewer but larger trees.

Prevention/Avoidance Strategies: Long-term maintenance of canopy cover would slow/prevent the establishment and growth of competitive vegetation. Periodic underburning or other fuels treatment would retard the development of ladder fuels.

Recommended Treatments:

Portions of the unit containing primarily conifers and hardwoods: A **density management (DM)** treatment that thins from below is the recommended treatment for these portions of **unit 6-1R**. Mark to retain an average of at least 60% canopy cover in areas of nesting, roosting, and foraging habitat. Mark to retain an average of at least 40% canopy cover in areas of dispersal habitat. This canopy cover is to be achieved by retaining: a) selected vigorous,

well-formed conifers 8" dbh and larger; b) selected conifers less than 8" dbh; and c) hardwoods. Conifers 8"dbh and larger should constitute, where possible, 85% or more of the minimum target canopy cover. Space conifers 8"dbh and larger at a 20'x20' spacing. Where conifers 8"dbh and larger are not present space conifers at a 16'x16' spacing. Retain remnant pine and cedar. Retain releasable pine and cedar. Thin hardwoods (a greater number of hardwoods can be removed from dispersal habitat and non-habitat areas). Remove co-dominant and smaller Douglas-fir, hardwoods, and shrubs within a radius of forty feet around dominant and co-dominant pine. Remove co-dominant and smaller Douglas-fir and white fir, hardwoods, and shrubs within a radius of thirty feet around dominant and co-dominant cedar. In areas with understory vegetation, do an understory thin (UT) treatment.

Young managed stands (Rattledell #1, Reuben Overlook #2, Section Creek #2, Reuben's Landing): An **understory thinning (UT)** treatment that reduces stand densities by cutting hardwoods and shrubs is the recommended treatment for these portions of **unit 6-1R**. Retain existing conifer stocking. Slash hardwoods and shrubs less than eight inches dbh taking care not to damage or bury conifer regeneration. Prune conifers twelve feet tall and greater.

Portion of unit to east of road 33-6-7 and spur going to the north - Areas not receiving a density management treatment: An **understory thinning (UT)** treatment that reduces stand densities from below is the recommended treatment for these portions of **unit 6-1R**. Space conifers less than eight inches in diameter (dbh) on a 14-20x' spacing (± 4' to allow for tree selection). Conifers 6-8"dbh to be spaced 20'x. Conifers less than 6"dbh to be spaced 14'x. Space off of conifers eight inches dbh and greater. Order of conifer species preference is ponderosa and sugar pine, incense cedar, Douglas-fir, and white fir. Form, vigor and ability to become a dominant or co-dominant tree outweigh species. Space tree-form hardwoods less than eight inches dbh on a 40'x40' spacing (± 10'to allow for tree selection). Space off of hardwoods greater eight inches dbh and greater. On stump sprouted hardwoods treat so as to retain only one or two main stems. Select madrone and chinquapin over tanoak. Slash shrubs.

All areas: Cut all vegetation less than eight inches dbh within a radius of forty feet around dominant and co-dominant pine. Cut all vegetation less than eight inches dbh within a radius of thirty feet around dominant and co-dominant cedar. Evaluate for need to treat fuels. Handpile and burn piles as appropriate. Evaluate 5-7 years after treatment for need for fuels treatment maintenance. Cut, handpile, burn piles or underburn if needed.

Silvicultural Options Considered: A treatment that only cut resprouting shrubs and hardwood sprouts was considered but rejected. That treatment would have not reduced overstory vegetation.

UNIT: 7-1R

T.33S. R.6W. section 7, T.33S. R.6W. section 18

Stand Description: Unit 7-1R is a ridgeline unit comprised of portions of several stands. Portions of the unit are young managed stands -where conifers have just recently become established. Douglas-fir is the principle conifer. Sprouting hardwoods consist of tanoak, chinquapin, and madrone. Portions of the unit consists of small pole and post size Douglas-fir with little understory. (see below in the recommended treatment section for the names of those stands). The remainder of the unit consists of brush and tree form tanoak, chinquapin, and madrone, mixed with Douglas-fir.

Analysis: The unit is designated as Matrix. A considerable investment of time and money has been made so that target stocking could be established within young managed stands in this unit. In these areas conifers have not yet shaded out sprouting hardwoods. This unit contains nesting, roosting, and foraging, habitat; dispersal habitat; and areas that are neither. Unit is situated along a ridge.

Desired Future Condition/Results: The desired future condition resulting from this action would vary depending on where in unit 7-1R a person was. In the young managed stands the treatment would focus on reducing shrubs and hardwoods. Competition on young conifers would be reduced so that their establishment and growth would be promoted. The time spent in the stand initiation phase of development would be reduced. In older and in "wild" portions of the unit the treatment would focus on reducing shrubs and hardwoods as well as reducing competition to desired leave conifers. Throughout the unit stand densities would be reduced which would result in reduced competition on retained trees. Growth rates of the remaining trees would be maintained or would increase. Ladder fuels within the unit would also be reduced. Slash in some areas would be piled and burned. In the long-term, vigor would be maintained. Crowns of existing trees would become fuller and canopy cover would increase from post treatment levels. Eventually canopy cover would return to near pretreatment levels. However, instead consisting of numerous smaller trees, the canopy would be formed from the crowns of fewer but larger trees.

Prevention/Avoidance Strategies: Development and long-term maintenance of canopy cover would slow/prevent the establishment and growth of competitive vegetation. Periodic underburning or other fuels treatment would retard the development of ladder fuels.

Recommended Treatments:

Young managed stands (Reuben Overlook #3B, Reuben Overlook #3, Reuben Overlook # 3-2, Reuben Overlook #3A, Reuben Overlook #4): An **understory thinning (UT)** treatment that reduces stand densities by cutting hardwoods and shrubs is the recommended treatment for these portions of **unit 7-1R**. Retain existing conifer stocking. Slash hardwoods and shrubs less than eight inches dbh taking care not to damage or bury conifer regeneration. Prune conifers twelve feet tall and greater.

Remainder of unit: An **understory thinning (UT)** treatment that reduces stand densities from below is the recommended treatment for this portion of **unit 7-1R**. Space conifers less than eight inches in diameter (dbh) on a 14-20x' spacing (± 4' to allow for tree selection). Space off of conifers eight inches dbh and greater. Order of conifer species preference is ponderosa and sugar pine, incense cedar, Douglas-fir, and white fir. Form, vigor and ability to become a dominant or co-dominant tree outweigh species. Space tree-form hardwoods less than eight inches dbh on a 40'x40' spacing (± 10'to allow for tree selection). Space off of hardwoods greater eight inches dbh and greater. On stump sprouted hardwoods treat so as to retain only one or two main stems. Select madrone and chinquapin over tanoak. Slash shrubs. Cut all vegetation less than eight inches dbh within a radius of forty feet around dominant and co-dominant pine. Cut all vegetation less than eight inches dbh within a radius of thirty feet around dominant and co-dominant cedar.

Both areas: Evaluate for need to treat fuels. Handpile and burn piles as appropriate. Any burning done within young managed stands should be done in a manner that minimizes loss of conifers (as in all units). Evaluate 5-7 years after treatment for need for fuels treatment maintenance. Cut, handpile, burn piles or underburn if needed.

Silvicultural Options Considered: No treatment at this time of portions of the unit was considered but was rejected due to the strategic location of the unit.

UNIT: 11-1R

T.33S. R.7W. section 11

Stand Description: Unit 11-1R can be divided into two parts. One part, east of road 33-7-2.1 consists of Douglas-fir generally 4-20"dbh mixed with tree-form and shrub-form tanoak and canyon live oak. Understories in this area is relatively open. Scattered larger remnant Douglas-fir and pine are present. Moving upslope and to the east conifers decrease and hardwoods become a larger part of the stand. The other part of unit 11-1R, to the west of road 33-7-2.1, consists primarily of pole and sawtimber size Douglas-fir 12-20"dbh. The understory here is open with areas of tree-form and shrub-form tanoak, evergreen huckleberry, and vine maple. Canopy cover is 80-90% and crowns are receding.

Analysis: This unit is designated as Matrix. Stand does not currently meet RMP guidelines for regeneration harvest. The unit is contains areas that are currently categorized as nesting, roosting, and foraging habitat for the northern spotted owl (NSO) as well as areas categorized as dispersal habitat. Portions of the units have high levels of canopy cover. Removal of some canopy would separate crowns and reduce crown bulk density. Areas within the unit are overstocked. Long-term stand vigor as well as growth is a concern.

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

Prevention/Avoidance Strategies: Long-term maintenance of canopy cover would slow/prevent the establishment and growth of competitive vegetation. Periodic underburning or other fuels treatment would retard the development of ladder fuels.

Recommended Treatment: An **understory thinning (UT)** treatment that reduces stand densities from below is the recommended treatment for **unit 11-1R**. Space conifers less than eight inches in diameter (dbh) on a 20'x20' spacing (± 4' to allow for tree selection). Space off of conifers eight inches dbh and greater. Order of conifer species preference is ponderosa and sugar pine, incense cedar, Douglas-fir, and white fir. Form, vigor and ability to become a dominant or co-dominant tree outweigh species. Space tree-form hardwoods less than eight inches dbh on a 40'x40' spacing (± 10'to allow for tree selection). Space off of hardwoods greater eight inches dbh and greater. On stump sprouted hardwoods treat so as to retain only one or two main stems. Select madrone and chinquapin over tanoak. Slash shrubs. Cut all vegetation less than eight inches dbh within a radius of forty feet around dominant and co-dominant pine. Cut all vegetation less than eight inches dbh within a radius of thirty feet around dominant and co-dominant cedar. Evaluate for need to treat fuels. Handpile and burn piles as appropriate. Evaluate 5-7 years after treatment for need for fuels treatment maintenance. Cut, handpile, burn piles or underburn if needed.

Silvicultural Options Considered: A density management treatment that removed merchantable material was considered but was rejected due to Riparian Reserves within the unit.

UNIT: 11-2R, 11-3R

T.33S. R.7W. section 11

Stand Description: These two units are the 1965 unit Rattlesnake Creek 'A.' After being clearcut in 1965, the unit was seeded in 1966. The unit received an aerial application of herbicide in 1982. The stand (the two new units) currently consists of second growth Douglas-fir 2-16"dbh with the majority of the stems being 2-8"dbh. Tree-form tanoak and chinquapin that is 6-8"dbh is mixed with the Douglas-fir. The understory is relatively open with some shrub-form tanoak and chinquapin. Madrone is present but limited and in places dying out of the stand as a result of being overtopped. Scattered 10-14"dbh sugar pine and ponderosa pine are also present as are areas containing only hardwoods. Canopy cover is 80-90%. Live crown ratios are generally 20-30% with dominant trees being 30-40%. Height/diameter ratios are high. Unit 11-2R is the Riparian Reserves within the stand. Unit 11-3R is the uplands.

Analysis: These units (the stand) are designated as Matrix. Condition of much of the Douglas-fir (live crown ratios and high height/diameter ratios) is a concern for long-term growth and yield. The units are currently categorized as dispersal habitat for the northern spotted owl (NSO). Portions of the units have high levels of canopy cover. Removal of some canopy would separate crowns and reduce crown bulk density.

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

Prevention/Avoidance Strategies: Long-term maintenance of canopy cover would slow/prevent the establishment and growth of competitive vegetation. Periodic underburning or other fuels treatment would retard the development of ladder fuels.

Recommended Treatments:

A **density management (DM)** treatment that thins from below is the recommended treatment for **unit 11-2R**. Mark to retain an average of at least 40% canopy cover across the unit. This canopy cover is to be achieved by retaining: a) selected vigorous, well-formed conifers 8" dbh and larger; b) selected conifers less than 8" dbh; and c) hardwoods. Conifers 8"dbh and larger should constitute, where possible, 85% or more of the minimum target canopy cover. Space conifers 8"dbh and larger at a 20'x20' spacing. Where conifers 8"dbh and larger are not present space conifers at a 16'x16' spacing. Retain remnant pine and cedar. Retain releasable pine and cedar. Thin hardwoods. In areas with understory vegetation, do an understory thin (UT) treatment. Evaluate for need to treat fuels. Handpile and burn piles as appropriate. Evaluate 5-7 years after treatment for need for fuels treatment maintenance. Cut, handpile, burn piles or underburn if needed.

An **understory thinning (UT)** treatment that reduces stand densities from below is the recommended treatment for **unit 11-3R**. Space conifers less than eight inches in diameter (dbh) on a 16'x16' spacing (± 4' to allow for tree selection). Space off of conifers eight inches dbh and greater. Order of conifer species preference is releasable ponderosa and sugar pine, incense cedar, Douglas-fir, and white fir. Form, vigor and ability to become a dominant or co-dominant tree outweigh species. Space tree-form hardwoods less than eight inches dbh on a 40'x40' spacing (± 10'to allow for tree selection). Space off of hardwoods eight inches dbh and greater. On stump sprouted hardwoods treat so as to retain only one or two main stems. Select madrone and chinquapin over tanoak. Slash shrubs. Evaluate for need to treat fuels. Handpile and burn piles as appropriate. Evaluate 5-7 years after treatment for need for fuels treatment maintenance. Cut, handpile, burn piles or underburn if needed.

Silvicultural Options Considered: A heavier cut that removed conifers with large height/diameter ratios and small live crown ratios as well as hardwoods was considered within the unit but was rejected. Removal of all or even most of these trees would leave the unit at less than the 40% canopy cover desired to maintain dispersal habitat.

APPENDIX 7 -AQUATIC CONSERVATION STRATEGY CONSISTENCY ANALYSIS

"The Aquatic Conservation Strategy was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on public lands. The strategy would protect salmon and steelhead habitat on federal lands managed by the Forest Service and Bureau of Land Management within the range of the Pacific Ocean anadromy" (Medford District RMP pg. 22).

The four components of the ACS are Riparian Reserves, key watersheds, watershed analysis, and watershed restoration. The ACS was designed to meet the nine objectives discussed below.

This ACS consistency analysis evaluates Fire Resiliency Project EA on BLM land.

Analysis of the Four Components of the ACS:

1. Riparian Reserves: The proposed project is consistent with the actions and directions within Riparian Reserves as described in the Medford District RMP. The Proposed Action would result in XXX acres of thinning and understory treatments to promote forest health and the development of large woody debris (LWD) within Riparian Reserves outside the Ecological Protection Zone (EPZ). Thinning would be designed to expedite the development of late successional, multi-story habitat conditions and restore the species composition and structural diversity of the plant communities, needed to achieve ACS and Riparian Reserve objectives (Medford RMP, pg 22, pg 26 respectively). Riparian Reserves within the proposed units are currently dominated by Douglas fir and some hardwoods. Most riparian stands are lacking large wood debris, downed logs, and large tree structure. Thinning of dense Riparian Reserves would reduce competition on the retained trees for light, nutrients, water and growing space, allowing trees would develop larger canopies, display better vigor and put on diameter growth faster than if left untreated.

The project is also consistent with the Best Management Practices (BMP) within Appendix D of the 1995 Medford RMP.

2. Key Watershed: The Planning Area is not located in a Key watershed. Hauling activities (approximately 17 miles) and vegetation treatment (approximately 900 acres) will be occurring within Middle Cow Creek.

3. Watershed Analysis: The Glendale Resource Area completed the Middle Cow Creek Watershed Analysis was completed in 1999. The proposed activity is consistent with the Watershed Analysis.

The Watershed Analysis found that management directions in the Northwest Forest Plan and the 1995 RMP including the Aquatic Conservation Strategy, Best Management Practices, and Riparian Reserve management would be adequate at protecting, maintaining and improving aquatic and riparian ecosystems. The Middle Cow Creek Watershed Analysis recommended reducing road densities which are not needed for future management.

The Middle Cow Creek Watershed Analysis discussed restricting road construction or considering alternatives to constructing new roads in sensitive soil areas. Permanent road construction is not proposed under the Fire Resiliency project. Many of the roads within the Fire Resiliency Project Planning Area are not public roads and are under reciprocal right-of-way agreements with private landowners because of the checkerboard ownership pattern. The BLM does not have the option to close these roads due to the reciprocal right-of-way agreements.

4. Watershed Restoration: Though the Fire Resiliency Project is not a watershed restoration project, it would aid in the improvement of watershed health through the following proposed activities: road maintenance, thinning, and activity fuels reduction in Riparian Reserves.

Analysis of the Fire Resiliency Project EA Proposed Action's consistency with the Aquatic Conservation Strategy objectives:

The ACS gives direction to maintain and restore ecosystem health at watershed and landscape scales. For the purposes of this analysis the watershed scale will be discussed in terms of site or project scale and will be at the HUC 6 and 7 watersheds. The landscape scale will be at the HUC 5 watershed level.

Appropriate consideration of potential cumulative effects is a critical element in determining a project's consistency with the ACS. The minimal effects at the HUC 7 scale would not reach a magnitude detectable at the HUC 6 or HUC 5 scales. Because there would be no detectable cumulative effects caused by the Proposed Action, cumulative effects will not be discussed in the 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 watershed and landscape-scale features which protect species, populations, and communities dependent on aquatic systems would be maintained and in some cases enhanced in the short term and long term. The distribution, diversity, and complexity of watershed and landscape-scale features needed for the protection of aquatic systems would be maintained. Proposed activities such as road maintenance and riparian thinning would restore watershed features in the short and long term.

Riparian Reserves

One key component of watershed and landscape scale features needed for the protection of aquatic systems is Riparian Reserves. Riparian Reserves would be maintained at the site and watershed levels in the short and long term. Riparian vegetation treatments (thinning) would enhance riparian characteristics. Riparian thinning would result in a reduction in stand densities in young dense stands and would allow for the development of late successional riparian characteristics. Some of these characteristics include multi-level canopy cover which helps to maintain cool water temperatures. Late successional characteristics in riparian areas also include downed coarse woody debris and LWD which increases channel complexity. Late successional characteristics in riparian areas also include diverse species composition which provides a variety of chemical and biological inputs to streams. Riparian thinning would also reduce the

spread of disease and the risk of a high intensity or severity fire within Riparian Reserves. Such a fire could result in tree mortality and a reduction in shade, which could negatively affect fish habitat by causing an increase in water temperature, a reduction in future recruitment of LWD, an increase in soil erosion and sediment entering streams.

Roads

Sedimentation would result from the blading of roads and pulling of ditchlines during maintenance of haul routes. There would also be a small amount of stream sedimentation from the use of this road at stream crossing locations. A small amount of sediment may also enter streams during log haul and existing road maintenance where roads are hydrologically connected. All sediment producing actions would result in measurable increases in sediment for no more than 25 feet downstream of the impact point, and would all be within the State of Oregon water quality standard of no more than a 10% increase in turbidity above and below the action.

Road renovation/improvement would reduce sediment entering stream channels in the short and long term. Road renovation/improvement would generally reduce chronic erosion problems and reduce sediment input to streams.

This project would not increase the number of permanent roads within this sub-watershed, since permanent road building is not part of the proposed project. No foreseeable permanent road construction is planned on federally managed lands within this sub-watershed.

Peak Flows

The Proposed Action would not affect the timing, magnitude, duration, and spatial distribution of peak, high and low flows. No regeneration harvest or overstory removal is proposed for this project.

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.

The spatial and temporal connectivity within and between watersheds would be maintained in the short and long term at the site and landscape scales. Chemically and physically unobstructed

routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species would be maintained.

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

The physical integrity of aquatic systems, including shorelines, banks, and bottom configurations would not be affected at the site or landscape scale in the short or long term. The proposed activities would not manipulate or affect shore lines, banks or bottom configurations.

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 quality necessary to support healthy riparian, aquatic and wetland ecosystems would be maintained. Water quality would remain within the range that maintains biological, physical, and chemical integrity streams.

Slight increases in turbidity would occur in the short term in localized areas as a result of road activities. Best Management Practices (BMPs) were designed to minimize the amount and duration of sediment entering stream channels. Such increases in turbidity would not measurably alter the biological, physical, or chemical integrity of streams. Aquatic and riparian dependent species' survival, growth, reproduction, and migration would be maintained.

Road maintenance on BLM land (17 miles), thinning, and hauling would have no effect on Oregon coast (OC) coho salmon (ESA-Threatened) or coho critical habitat (CCH). The closest coho presence and CCH in Bear Creek is approximately 800 feet from the closest thinning unit. The closest coho presence and CCH in Rattlesnake Creek and Stevens Creek is approximately 25 feet way from the closest haul road segment (two total). These two road segments represent culverts over CCH. Sediment would not be transported to CCH because of the dry condition haul, EPZs, the proximity of the road to fish habitat and the design features to reduce the transmission of fine sediment. Sediment resulting from the haul and road maintenance would not be of a magnitude that would result in a visible increase in stream turbidity, or a measurable increase in the overall stream sediment deposition for more than 25 feet downstream within any of the stream channels.

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.

The sediment regime under which aquatic ecosystems evolved would be maintained at the site and landscape scales in the short and long terms. Some of the proposed activities such as road maintenance would reduce sediment input in the short and long term. Streams within the Planning Area evolved with sediment input. Sediment input can result from natural disturbances such as landslides, slumps, wildfires, bank erosion, and channel scour.

Road Related Activities

The following road related activities proposed could deliver sediment to streams: road maintenance and haul. Sediment input would primarily be seen during the first winter. Because of PDFs the amount of sediment entering streams from road related activities would be minimal. Changes in embeddedness, interstitial spaces, and pool depth would not be measurable. Following the first winter and thereafter sediment entering streams would decrease to the point of being negligible.

Roads proposed for dry condition haul would result in negligible amounts of sediment entering streams because the roads are either bituminous surface treatment (BST) or crushed aggregate

(rocked) or are hydrologically disconnected due to ridgetop location of timbersale units. The roads proposed for dry condition haul could result in sediment entering stream channels, however; negligible changes to stream channels from sediment input would be expected. Changes in embeddedness, interstitial spaces, and pool depth would not be measurable.

Road maintenance would result in a minimal amount of sediment reaching stream channels. Increased sediment levels from road maintenance would not be detectable above background levels following the first few substantial rain events, therefore sediment input would be short term. Negligible changes to stream channels from sediment input would be expected. Changes in embeddedness, interstitial spaces, and pool depth would not be measurable. Following the first winter and thereafter sediment entering streams would decrease to the point of being negligible.

Harvest Activities

All other soil disturbing activities are located outside the EPZ, and would be implemented using BMPs that minimize the quantity and transport of soil erosion. Since the EPZ is designed to filter out sediment produced during upslope activities that are implemented using BMPs, these activities would not result any sediment entering streams.

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.

The Fire Resiliency Project would not affect the timing, magnitude, duration, and spatial distribution of peak, high and low flows. No regeneration harvest or overstory removal is proposed in this project.

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

The timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands would not be affected by any of the proposed activities. There are no wetlands, as defined on page 117 of the RMP, within the Planning Area.

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.

The species composition and structural diversity of plant communities in riparian areas would be maintained at the site and landscape scales in the short and long term. There are no wetlands, as defined on page 117 of the 1995 RMP, within the Planning Area. Vegetation treatments proposed in the Proposed Action were designed to enhance riparian conditions in the short and long term. Plant communities in riparian areas would be maintained and enhanced through silvicultural prescriptions and no treatment buffers in order to provide for 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.

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

Habitat for riparian-dependent plant, invertebrate and vertebrate species would be maintained at the site and landscape scales. Vegetation treatments proposed were designed to enhance riparian conditions in the short and long term. There would not be a reduction of habitat needed to support riparian dependant species in the short term or long term.

CONCLUSION:

Based on this analysis at both the site and landscape scale of the proposed activities in the Fire Resiliency Project, it was determined that the actions are consistent with the nine objectives and the four components of the ACS. This determination was based on the small spatial and temporal disturbances associated with the proposed activities.

APPENDIX 8 - NOXIOUS WEEDS

Specialist Report Memo

To: Katrina Symons, Field Manager, Glendale Resource Area

From: Rachel Showalter, Botanist, Glendale Resource Area

Re: Noxious Weed Rationale Report for the Fire Resiliency Planning Area

Date: March 28, 2011

<u>Fire Resiliency Planning Area – Noxious Weeds</u> – PRESENT, NOT AFFECTED

Units with the Fire Resiliency Planning Area were surveyed for noxious weeds in the spring of 2010. The Planning Area is known to have noxious weeds along some roadsides. One populations of *Rubus armenicus* (Blackberry), 4 populations of *Cirsium arvense* (Canada thistle), two populations of *Cystisus scoparius* (Scotchbroom), 2 populations of *Chondrilla juncacea* (Rush skeletonweed), and 3 populations of *Centaurea nigrescens* (Meadow knapweed) and were documented within proposed units. (Table A8-1).

Based on these population sizes, per noxious weed reports provided by professional botany contractors, the Glendale botanist estimated that less than 1% of the harvest unit / road renovation/improvement / temp route construction acreage harbor noxious weeds. The maximum square footage occupied by all noxious weed species reported in or directly adjacent to Fire Resiliency units is approximately 8,500 sq. ft (0.19 acres).

Table 8-1. 2010 Plant Surveys Revealing Noxious Weed Species in the Fire Resiliency Planning Area Units

Location in Township (T), Range (R), Section (S)	Species	Coverage in Sq. Feet	Oregon Department of Agriculture Designation	Plant Description / Habitat Requirements
T33S-R7W-11	Himalayan blackberry	40	B*	Himalayan blackberry is a robust, clambering or sprawling, evergreen shrub which grows up to 9.8 feet (3 m) in height (Munz, 1974). Himalayan blackberry typically grows in open weedy sites, such as along field margins, railroad right-of-ways, roadsides, and riparian areas (Crane, 1940; Hitchcock et. al, 1973; Laymon, 1984; Roberts, 1980).
T32S-R6W-1	Canada thistle	400 20 30	B*	Generally, Canada thistle establishes and develops best on open, moist, disturbed areas, including ditch banks, overgrazed pastures, meadows, tilled fields or open waste places, fence rows, roadsides, and campgrounds; and

T32S-R6W-11		1000		after logging, road building, fire and landslides in natural areas (Romme et al, 1995). Canada thistle is an early seral species, susceptible to shading, and grows best when no competing vegetation is present (Donald, 1994). Canada thistle growth may be discouraged in disturbed natural areas if suitable native species are seeded densely enough to provide sufficient competition (Haber, 1997).
T32S-R6W-1 T32S-R6W-11	Scotch broom	200 10	B*	Tansy ragwort, a biennial herb, requires sunlight and a disturbed site to establish. It is often found on roadsides, contributing to the spread of new infestations. Tansy ragwort will establish in disturbed sites including roadsides, pastures, and forested areas recently harvested for timber (Sweeney et al. 1992). The cinnabar moth (*Tyria jacobaeae*) is the biological agents effectively used to control tansy ragwort in Oregon, California, and Washington (Rees et. al, 1996).
T32S-R6W-1	Rush skeletonweed	1200		Rush skeletonweed is a perennial plant that belongs to the sunflower family. It ranges from 1 to 4 feet tall, with a taproot reaching down 7 feet or more. Rush skeletonweed reproduces by seed and vegetatively. Mature, vigorous plants can produce 1,500 flower heads, with the capability of producing 20,000 seeds. Each seed has a pappus, which is capable of carrying seeds along wind currents up to 20 miles. Rush skeletonweed also spreads by shoot buds found along lateral roots, and from shoot buds found near the top of the main tap root. A more problematic weed, vegetative spread is also possible when a root fragment, as deep as 4 feet down, is left in the ground. When the plant stem or root is mechanically injured, vegetative growth is initiated (Washington State Weed Control, 2008).
T32S-R6W-11	Meadow knapweed	5600		Knapweed, a hardy biennial/perennial, favors moist roadsides, sand or gravel bars, river banks, irrigated pastures, moist meadows, and forest openings (ODA, 2005). Prefers full sun and well-drained soils. Many infestations start on rights-of-way or from infested gravel or fill. Seeds are often transported by automobiles, contaminated fill and gravel, and by wildlife (DNR, 2004).

Total Sq. feet		8500 sq ft = 0.19 ac		

* "B" designation; a weed of economic importance which is regionally abundant but which may have limited distribution in some counties. Where implementation of a fully integrated statewide management plan is not feasible, biological control shall be the main control approach (ODA, 2005).

Over the last 150 years activities such as motor vehicle traffic, recreational use, rural and urban development, timber harvest, road construction, and natural process have introduced and transported noxious weeds into the Rogue Valley. Noxious weeds are spread by the wind and by seed via attachment to vehicles and vectors such as humans, animals, and birds, and are able to grow on suitable habitat (generally considered as any newly disturbed ground and/or an influx of light due to canopy removal). Since the 1970's, a recognition that weeds were causing environmental damage resulted in the passage of State noxious weed laws, the Carson-Foley Act of 1968 – Plant Protection Act of 2000, and Presidential executive orders like Invasive Species E.O. 13112, which directs federal agencies to combat the noxious weeds on federal lands. Additional direction is provided by the Medford District RMP, which states the district is to "contain and/or reduce noxious weed infestations on BLM-administered land...(p. 92)," and "...survey BLM-administered land for noxious weed infestations…(p. 93)." These RMP directions for weed management are intended to be met at a landscape level; whether the direction is achieved is not intended to be measured at the site specific level nor with the implementation of each project. Thousands of acres of weed treatments have occurred on federal (and non-federal) lands over the last decade across the Medford District with the RMP-driven objective of containing or reducing – not eradicating - noxious weed populations (Budesa, 2006). In an effort to continue to contain and/or reduce noxious weeds on federal land, the BLM proposed to treat known weed populations within the Glendale Resource Area. In 2009 and 2010, over 1,000 acres of BLM land in the Glendale RA was treated, including roadsides adjacent to Fire Resiliency units. Many roadsides within the Fire Resiliency planning area are scheduled for subsequent treatment in 2011.

Environmental Consequences of the Fire Resiliency Project Implementation

Alternative 1 (No Action) – Direct and Indirect Effects

Under the No Action Alternative, noxious weeds within the Planning Area would continue to spread into suitable habitat at an unknown rate. The rate at which noxious weeds spread is impossible to quantify, as it depends on a myriad of factors including, but not limited to, logging on private lands, motor vehicle traffic, recreational use, rural and urban development, and natural processes (Northwest Area Noxious Weed Control Program EIS, p. 59). The following table (1-2) illustrates how each of these activities affects noxious weed dispersal.

Table A8-2. Factors Affecting the Determination of the Rate of Noxious Weed Spread

Activity	Role in Potential Noxious Weed Seed Dispersal
Private Land	Private lands host a perpetual source for noxious weed seed, which can be dispersed when seeds attach to tires, feet, fur, feathers or feces, or when natural processes such as wind and/or flooding events transport the seed from its source to another geographical vicinity.

Logging on Private Lands	Logging activity presents a key dispersal opportunity for noxious weed seeds per 1) attachment to tires/tracks of mechanized logging equipment, tires of log trucks, and various other logging-related substrates which subsequently transport the seed from its source to another geographic vicinity, 2) creation of openings for potential noxious weeds colonization and 3) a lack of PDFs – such as equipment/vehicle washing, etc. - which attempt to reduce the activity's spread of noxious weed seeds.
Motor Vehicle Traffic (including Log Trucks)	Roads on public land include public use, which results in a plethora of seed-dispersing activities occurring on a daily basis. Private landowners use public roads to haul logs, undertake recreational pursuits, and/or access their properties. This transportation often occurs along BLM-administered roads, which are situated within a checkerboarded ownership arrangement. How or when seed detachment occurs is a random event could take place within feet or miles from the work site/seed source, presenting a high likelihood of detachment on public lands.
Recreational Use	The public often recreates on BLM-managed public lands, and can spread seed from their residences to public land in a variety of ways such as attachment to vehicle tires, hikers' sox, shoes, or other clothing, the fur of domesticated animals, etc.
Rural and Urban Development	Rural development occurring within the checkerboard land arrangement often requires public landowners to acquire a Right-of-Way (ROW) from the BLM to legally access their parcel(s). These ROWs, or use of BLM-administered roads is often granted (Groves, 2006). Please refer to 'Motor Vehicle Traffic' and 'Private Land,' for clarification of how this affects the spread of noxious weeds from private to public lands.
Natural Processes	Wind, seasonal flooding, and migration patterns of birds/animals are a few natural processes that potentially spread noxious weeds, especially from private land to public land. Wind carries seeds, and deposits them at random intervals. High water caused by flooding reaches vegetation (often harboring a noxious weed component) growing on the banks of rivers/creeks/streams, and deposits seeds downstream.

The abovementioned activities would contribute to noxious weed spread, which could degrade some elements of the environment. To predict the rate of this degradation would be highly speculative, as the extent of weed expansion is dependent on so many factors that it is considered impossible to quantify. The degree of degradation would depend on the noxious weed species, as some, such as scotch broom and meadow knapweed, are more intrusive than others. Across the Glendale Resource Area, the more aggressive species are slated for treatment under Medford District's *Integrated Weed Management Plan and Environmental Assessment OR-110-98-14* under a separate project. However, the success of implementing the weed management plan would be temporary, as logging on non-federal lands, recreational use, rural and urban development, natural processes and vehicle traffic will continue to spread noxious weed populations into the Planning Area.

Indirect effects of noxious weed spread include the potential degradation of wildlife habitat (Rice et. al. 1997, Harris and Cranston 1979), a decline in natural diversity (Forcella and Harvey 1983; Tyser and Key 1988; Williams 1997), and decline in water quality (Lacey et al. 1989); however, a very small amount of Fire Resiliency unit acreage (less than 1% of unit acreage under Alt. 2) is covered by noxious weeds, making it difficult to quantify any potential decline in ecosystem health related to existing noxious weed populations, or to quantify the potential decline in

ecosystem health related to any additional noxious weed populations potentially established by the activities described in Table A8-2.

Alternative 2 (Proposed Action) – Direct and Indirect Effects

In the short term (approximately 1-5 years), proposed activities within the Planning Area would result in the reasonable probability of spreading noxious weeds. However, the rate at which this potential spread would occur is unknown due to the indistinguishable causal effect of other activities and factors listed in table A8-2 on the spread of noxious weeds. Openings, caused by logging (894 acres) and 2.2 miles (~ 4.8 ac) of temporary route construction, would provide suitable habitat for noxious weeds to colonize. In addition, during project implementation, increased vehicle traffic could increase, or at least perpetuate, weed infestations along road systems because of seed dispersal.

Openings and disturbance provide the greatest opportunity for the establishment of noxious weeds. In an effort to address the potential for project activities to increase the rate of spread of noxious weeds, Project Design Features (PDFs) have been included in the project to decrease the potential spread of weeds associated with the Proposed Action. Project Design Features include washing equipment prior to moving it on-site, operating vehicles/equipment in the dry season, and seeding and/or planting newly created openings with native vegetation to reduce the potential establishment of noxious weeds. These PDFs are widely accepted and utilized as Best Management Practices (BMPs) in noxious weed control strategies across the nation (Thompson, 2006). Table A8-3 delineates the project design features and their expected implementation results.

Table A8-3: Project Design Features and Expected Implementation Results

Project Design Feature (PDF)	Result of Implementing PDF
Washing vehicles / equipment	Removes dirt that may contain viable noxious weed seeds, thereby reducing the potential for noxious weed spread
Operating vehicles/equipment during the dry season	Reduces the potential for viable noxious weed seed to be transported and dispersed via mud caked on the undercarriages/tires/tracks of logging equipment.
Seeding and/or planting newly created openings with native seed vegetation.	Introduces native vegetation to the site prior to noxious weed seed recruitment, allowing native plants an advantageous jump-start in reestablishment, which reduces the potential for noxious weed infestation.

Implementing the PDFs that reduce the potential spread of noxious weeds associated with the Proposed Action, and using native species for seeding/planting newly disturbed openings is expected to result in a similar potential of noxious weed expansion as associated with the No Action Alternative.

In the long term (5-100 years), tree canopies would eventually expand and reduce light levels, which in turn would prevent weeds from growing and expanding within treated areas, because populations decline as the amount of light reaching the plants diminishes. Consequently, in the long term, remaining weed populations would be confined to the road prism and adjoining (private) disturbed land as canopy is re-established in treated areas over time.

The effect of implementing Alternative 2 could possibly result in the establishment of new noxious weed populations. Although the *immediate* potential for weed spread would be less with the No-Action Alternative than for the Proposed Action, the potential for the spread of existing noxious weeds and the introduction of new species is considered similar for both alternatives, because of the inclusion of PDFs in Alternative 2, and the fact that under the "No Action" Alternative, populations would continue to establish and spread due to seed transport by vehicular traffic, wildlife, and other natural dispersal methods listed in Table A8-2. Indirect effects associated with noxious weed population enlargement are similar to those mentioned in the No Action Alternative, and are known to include, generally, declines in the palatability or abundance of wildlife and livestock forage (Rice et al., 1997), declines in native plant diversity (Forcella and Harvey, 1983; Tyser and Key, 1988; Williams, 1997), reductions in the aesthetic value of the landscape, encroachment upon rare plant populations and their habitats, potential reductions in soil stability and subsequent increases in erosion (Lacey et. al, 1989), and an overall decline of ecosystem health. However, considering implementation of Alternative 2, there are three main reasons why potential weed establishment that might be caused by the Proposed Action is not expected to result in a detectable effect to overall ecosystem health. First, surveys indicate that a very small percentage - less than 1% of acreage within the Project Area units - are affected by noxious weeds. Second, these sites located in units proposed for treatment have been reported during pre-disturbance surveys, and some (depending on how aggressive the species is) have already received treatment in 2010 under Medford District's *Integrated Weed Management Plan and Environmental Assessment OR-110-98-14,* which means that the acreage in the Planning Area affected by noxious weeds is now even closer to 0% until ongoing activities listed in Table A8-2 would potentially re-introduce weeds into the Planning Area. Third, as aforementioned, Project Design Features (PDFs) have been established to minimize the rate at which project activities might potentially spread noxious weed seed from outside/adjacent sources.

<u>Alternative 2 (Proposed Action)</u>

In order to address the cumulative effects of the Proposed Action on the spread of noxious weed encroachment, the condition of non-federal lands must be considered. However, there is no available or existing data regarding noxious weed occurrence on local non-federal lands. Therefore, for purposes of this analysis, BLM assumes that 1) there is a perpetual source of noxious/invasive weeds on non-federal lands that can spread to federal lands, especially when the land ownership is checkerboarded, as within the Planning Area, and 2) conversely that noxious weeds are not established on these lands, and therefore there is a need to reduce the risk of spread of noxious weeds from the federal lands to the adjoining non-federal lands. Seeds are spread by the wind, by animal/avian vectors, natural events, and by human activities - in particular through soil attachment to vehicles. BLM's influence over these causes of the spread of noxious weeds is limited to those caused by human activities. Additional human disturbance and traffic would increase the potential for spreading noxious weed establishment, but regardless

of human activity, spread of these weeds would continue through natural forces. Thus, the BLM cannot stop the spread of noxious weeds, it may only reduce the risk or rate of spread.

Given the unpredictable vectors for weed spread, such as the vehicle usage by private parties, wildlife behavior, and wind currents, it is not possible to quantify with any degree of confidence the rate of weed spread in the future, or even the degree by which that potential would be increased by the Proposed Action.

Foreseeable activities within the Planning Area are expected to be similar to past and current activities: motor vehicle traffic, recreational use, rural and urban development, timber harvest, road construction, and firewood collection. These types of activities could result in new disturbed sites available for colonization by existing noxious weed populations, and they do offer the possibility of introduction of new noxious weed species to the Planning Area under any alternative, including the No-Action Alternative. As stated above, there is no available or existing data concerning the rate of weed spread occurring on either federal or non-federal lands as a consequence of these types of activities. Also, as discussed above, there is no information on what, if any, increase in the rate of weed spread the Proposed Action would cause, and hence, it is not possible to quantify with any degree of confidence what the incremental effect of the Proposed Action on the spread of noxious weeds would be when added to the existing rate of weed spread caused by past, present, and future actions.

PDFs exist to reduce the potential that the Proposed Action would contribute to the spread of weed seed and establishment of new populations. PDFs are not intended or expected to completely eliminate any possibility that the Proposed Action would contribute to the spread of weed seed and establishment of new populations; however, PDFs ensure that any incremental contribution of the Proposed Action to the spread of weeds, when added to the rate of weed spread caused by past, present, and future actions, would be so small as to be incapable of quantification or distinction from background levels.

As described above, PDFs for this project include washing vehicles/equipment, operating in the dry season, and seeding/planting newly created openings with native vegetation. BLM, and other federal and nonfederal organizations involved in combating noxious weed spread, routinely utilize these PDFs in noxious weed control strategies. These PDFs are widely accepted as Best Management Practices (BMPs), as they are inexpensive to implement, easily attainable, and accomplish the objective of reducing the potential of spreading noxious weeds as a result of project-oriented activities.

Data collection would not reduce the inherent speculation in predicting incremental effects of the proposed action on the spread of weeds because of (1) the unpredictable natural factors that largely determine whether weeds would spread after project activities, (2) the unlikelihood that future data collection would be able to detect or measure any difference between background rates of weed spread and the rate of weed spread as affected by the Proposed Action and correspondingly reduced by PDFs, and (3) the included PDFs that would reduce, if not eliminate, any project effects on the rate of weed spread that would make the already undetectable effects of the Proposed Action even more undetectable. Finally, further data collection on the rate of spread would not alter the PDF techniques already being applied to reduce that rate of spread. It cannot be over emphasized that under the “No Action” Alternative, noxious weeds are likely to

spread over time regardless of whether or not the Fire Resiliency project occurs, and that rate would not be altered to any detectable degree by the Proposed Action.

References

Websites:

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http://www.nwcb.wa.gov/weed_info/Written_findings/Chondrilla_juncea.html

http://www.fs.fed.us/database/feis/plants/forb/cirarv/all.html

http://www.weedmapper.org

http://www.nwcb.wa.gov/weed_info/Chondrilla_juncea.html

APPENDIX 9 - SPECIAL STATUS SPECIES

Specialist Report Memo

To: Katrina Symons, Field Manager, Glendale Resource Area

From: Rachel Showalter, Botanist, Glendale Resource Area

Re: Special Status Plants Rationale Report for the Fire Resiliency Planning Area

Date: March 29, 2011

T/E Plants – NOT PRESENT, NOT AFFECTED

Of the four federally listed plants on the Medford District (*Fritillaria gentneri, Limnanthes flocossa* ssp. *grandiflora*, *Arabis macdonaldiana*, and *Lomatium cookii)*, only *Fritillaria gentneri* has a range which extends into the Glendale Resource Area. Final units within the Fire Resiliency Project Area are not within the range of *F. gentneri*, as determined by the 2004 US Fish and Wildlife Service Biological Opinion. Vascular plant surveys were conducted in the springs of 2009 and 2010, and no *Fritillaria gentneri* populations were found. There would be no anticipated effect from the Proposed Action on any federally listed plant.

Bureau Special Status & Survey and Manage Plants – PRESENT, NOT AFFECTED

On July 26, 2007 a new Special Status Species list went into affect (IM No. OR-2007-072), coupled with a new Interagency Special Status Species Policy (ISSSP). This new list has two categories, (ISSSP) Sensitive and Strategic. The former categories of Bureau Assessment and Bureau Tracking no longer exist. Sensitive species require a pre-project clearance and management to prevent them from trending toward federal listing. There is no pre-project clearance or management required for the Strategic Species at the BLM District level, thus Strategic Species will not be analyzed in this document.

In addition to the new Special Status Species policy, Survey and Manage requirements have been re-instated as of December 2009. In summary, all projects within the range of the northern spotted owl may move forward if they fall within one of two categories;

1) the project fits at least one of the four exemptions listed in the October 11, 2006 , modified injunction in Northwest Ecosystem Alliance V. Rey, Case No. 04-844-MJP (W.D. Wash. Oct. 11, 2006), **or**
2) the project complies with the 2001 Record of Decision without Annual Species Reviews.

This initial direction is a result of Judge Coughenour's order of December 17, 2009, regarding survey and manage species (Conservation Northwest v Rey. Case No. C08-1067-JCC (W.D. Wash. Dec. 17, 2009) (DRAFT IM 2010-1790). Category 1 is commonly also referred to as the Pechman order, which states that projects operating in stands less than 80 years old are exempt

from S&M survey requirements. This project does not fit into the Pechman exemption, and as such, botanical surveys were completed for both ISSSP and Survey and Manage A & C species.

Vascular and nonvascular plant surveys were conducted in the fall of 2009 and 2010, and the spring of 2010, respectively. Professional botanists surveyed the Planning Area units using intuitive controlled methodology, wherein areas supporting high potential habitat were surveyed more intensively; surveys were also in compliance with the 2001 Survey and Manage protocol, which requires surveys for Category A and C species. Survey and Manage protocol also requires managing known (documented) sites of Category A, B, C, and E species, managing 'high-priority' Category D species, and no site management requirement of Category F species. Surveys revealed the following new sites; (4) *Chaenotheca ferruginea* (S&M B), (2) *Chaenotheca furfuracea* (S&M F), (2) *Piperia elongata* (STR) and (1) *Lotus stipularis* (SEN).

The vascular species *Lotus stipularis* is a Sensitive species and will receive a 80-100 foot protection buffer. The vascular species *P. elongata*, is a Strategic species and will not be analyzed in this document. *Chaenotheca ferruginea* is a S&M B species, and will be buffered to ensure species persistence at each site. As such, buffers may range from 5-100 feet, depending on site-specific conditions. For *C. furfuracea*, a Category F species, site management is not required.

It is important to note that regarding the above-mentioned buffers, the actual buffer itself may be comprised of either a physical buffer made from flagging, or a virtual buffer provided on a map. In either case, the intent of the buffer is to provide awareness of the site, and to prevent any activity from occurring within the buffer radius that would jeopardize species persistence.

Bureau Special Status & Survey and Manage Fungi – NOT PRESENT, NOT AFFECTED

Special Status

The Project Area was not surveyed for ISSSP Sensitive fungi, as pre-disturbance surveys for Special Status fungi are not practical, nor required per BLM – Information Bulletin No. OR 2004-121, which states "If project surveys for a species were not practical under the Survey and Manage standards and guidelines (most Category B and D species), or a species' status is undetermined (Category E and F species), then surveys will not be practical or expected to occur under the Special Status/Sensitive Species policies either (USDA/USDI 2004a, p.3)." Current special status fungi were previously in the aforementioned S&M categories which did not consider surveys practical, and are therefore exempt from survey requirements. With the recent instatement the new Interagency Special Status Species policy (ISSSP), 20 species of fungi were designated as Sensitive, 9 of which have been documented on Medford District. As mentioned above, none of these species require surveys.

District wide, the Medford BLM has 20 Sensitive (SEN) fungi species; 11 are suspected to occur here, while the remaining 9 have been documented. Of the 9 documented species, only one, *Phaeocollybia olivacea*, has been found in the Glendale Resource Area, approximately 0.5 air miles away from the closest unit in the Project Area. The two areas reside within the same HUC 5 watershed (Middle Cow), and share similar westerly aspects. However, although dispersal via spore transport and/or mycelial network is possible, the documented *P. olivacea* site is located in a

riparian microhabitat. In contrast, the closest Fire Resiliency unit is 1000 ft in elevation higher and along ridgeline, and as such, is devoid of any riparian habitat. In addition, fungi identification can be tricky, and the existing site - which can be easily confused with two other green-capped species, *P. fallax* and *P. pseudofestiva* (Norvell and Exeter, 2008 p 122 & 123) - was never verified by a fungi specialist.

While it is possible that this project is occurring within potential habitat for some species, there is very little information available describing the *exact* habitat requirements or population biology of these species (USDA/USDI 2004c, p.148). The 2004 FEIS to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines addresses this type of incomplete and/or unavailable information (p. 108-109). However, the *2004 Record of Decision* (ROD) *to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines*, offers a broad scale prospective of this current situation in stating, "Any discussion of risk based on rarity and likelihood of disturbance must recognize that, for many species, only a small percentage of potential habitat has been surveyed. Reserves have not been surveyed to the same degree as Matrix and Adaptive Management Area land allocations. The Reserves were not surveyed because there has been little management-induced disturbance there. The vast majority of pre-disturbance surveys have been located in the Matrix and Adaptive Management Area land allocation (19 percent of the northwest Forest Plan area), so that is where many of the known sites have been found. This does not mean that a disproportionate amount of their habitat is located in Matrix. If these species are truly closely associated with late-successional or old-growth forests, we can reasonably expect that the large amount of federally managed lands in Late-Successional and Riparian Reserves which provide the most amount of this type of habitat (86 percent of currently existing late-successional forests is in reserves) would also provide, at a minimum, its proportionate share of the habitat to support populations of these species (2004 ROD to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines, p.11)."

Based on the above information, the likelihood of a Sensitive fungi species in this Project Area is very low; the likelihood of a sensitive fungi occurring within a single unit(s) encompassed in the Project Area is even lower. The likelihood of contributing toward the need to list is not probable.

Survey and Manage

The Project Area was not surveyed for fungi to Survey and Manage protocol standards, as stand ages are less than 180 years. For NEPA decisions signed in fiscal year 2011 and beyond for habitat-disturbing activities in old-growth forest, the 2001 S&M ROD (Forest Service and Bureau of Land Management 2001, S&G-9) gives direction to conduct equivalent effort surveys for category B fungi species if strategic surveys have not been completed for the province encompassing the project. The Survey and Manage Standards and Guides defines old growth forest as an ecosystem distinguished by old trees and related structural attributes that are usually at least 180 to 220 years old (Forest Service and Bureau of Land Management 2001, S&G-79). Strategic surveys have not been completed for category B fungi for the province containing the Fire Resiliency project area, and equivalent effort surveys have not been completed as units do not exceed 180 years of age.

Alternative 1 – No Action

Direct and Indirect Effects

T&E, ISSSP Sensitive, & Survey and Manage Vascular Plants

There would be no direct or indirect effects to ISSSP Sensitive or Survey and Manage vascular plants under Alternative 1 because no physical disturbance would occur that could impact them.

ISSSP Sensitive & Survey and Manage Nonvascular Plants
No direct or indirect effects would occur to ISSSP Sensitive or Survey and Manage nonvascular plants because no activities would occur that could impact them.

ISSSP Sensitive & Survey and Manage Fungi

There would be no direct or indirect effects to ISSSP Sensitive or Survey and Manage fungi under Alternative 1 because no physical disturbance would occur. There would be no loss of late-successional forest which provides suitable habitat for the 11 suspected and 9 documented Medford District BLM Sensitive fungi.

Cumulative Effects

Information is not available about rare plant populations in the Fire Resiliency Planning Area prior to BLM botanical surveys, which began during the last 25 years. However, past activities, described in the affected environment, likely affected Special Status plants and populations by damaging or destroying individuals or reducing or degrading suitable habitat.

Although specific logging plans (or fuels reduction efforts) for private industrial forest lands are not available, it is assumed that commercial harvest will occur in the future on relatively short rotations, and that privately-owned forests will remain in early to mid-seral stages. Sensitive and Survey and Manage species do not receive protection on privately-owned lands, but will continue to be protected and conserved on federal lands, according to BLM policy (IM OR-91-57).

Alternative 1 would not contribute additional cumulative effects to ISSSP vascular / nonvascular plants, or fungi. The amount of late-successional forest on BLM-managed lands would remain unchanged.

Alternative 2

Direct and Indirect Effects

T&E, ISSSP Sensitive, & Survey and Manage Vascular Plants

There would be no direct or indirect effects to ISSSP or Survey and Manage vascular plants under Alternative 2 because only one such site, *L. stipularis*, is within project area units, and it will receive a protection buffer.
ISSSP Sensitive & Survey and Manage Nonvascular Plants

No direct or indirect effects would occur to ISSSP Sensitive species because none exist within project area units. The Survey and Manage B species present in 32-6-1 and 32-6-11, *C. ferruginea*, will receive a protection buffer, thus effects are not anticipated.

ISSSP Sensitive & Survey and Manage Fungi

ISSSP Sensitive

No official fungi surveys were performed, therefore it is unknown if Sensitive fungi are present in the treatment units. Potential habitat for many of the 20 Sensitive species exists in the Project Area because a predominant Douglas-fir component is present (generally considered an indicator species, but recorded sites commonly have white fir as well), but predicting their presence is difficult because the habitat requirements are poorly understood. Because of their rarity across the Northwest Forest Plan area, it is unlikely that populations are present in the final treatment units. However, if present, they could be directly or indirectly adversely impacted by the proposed actions in Alternative 2.

Survey and Manage

No fungi surveys have been conducted in accordance with Survey and Manage protocol in the Fire Resiliency Project Area. In general, harvest activities will occur when fungi species are dormant, thus anticipated effects to the species would be minimized. Fuels activities – specifically underburning and pile burning - on the other hand, will typically occur when fungi are more active (ie, fruiting bodies could be above-ground). However, underburns would be low-intensity, and pile burning would occur in a mosaic-like pattern across some of the units, leaving a vast majority of the ground undisturbed.

ISSSP and S&M

Thinning and fuels reduction activities can have varying degrees of adverse impacts on fungi, depending on the level of tree removal and ground disturbance. Removing, disturbing, or compacting the top layer of organic material and mineral soil could negatively impact fungi. The main and most extensive part of the fungus consists of a below-ground mycelia network that resides in the top few inches of mineral soil. Mycelia networks are often connected to multiple trees through their root systems. In one study, fungal mycelia networks ranged in size from 1.5 - 27 square meters (Dahlberg and Stenlid 1995). Disruption of mycelia networks could occur during timber harvest, construction or ripping of roads or landings, removal of host trees that sustain the ectomycorrhizae, or burning handpile-and-burn piles and/or post-harvest slash piles. The effect of these activities on fungi is a loss of species diversity and abundance (Amaranthus et al. 1996). Alternative 2 presents a potential risk of impacting Sensitive fungi, if present, because it proposes temporary roads, fuels activities, and the harvesting of trees.

Fungi could also be directly impacted from radiant heat during burning of handpile and post-harvest slash piles. Effects of pile burning include damage or death of mineral soil fungi including the mycelia and spores; loss of litter, organic matter and large wood, resulting in reduced moisture retention capability, loss of nutrient sources, and changes in fungal species diversity and abundance. Implementation of Alternative 2 creates the greatest threat of damage to fungi from burn piles because of the thinning and fuels reduction activities. However, as previously stated, underburns would be low-intensity, and pile burning would occur in a mosaic-like pattern across some of the units, leaving a vast majority of the ground undisturbed.

Cumulative Effects.

Information is not available for rare plant populations in the Fire Resiliency Area prior to BLM botanical surveys, which began during the last 25 years. However, it is assumed that past activities, described in the affected environment, likely affected Sensitive / S&M plants and populations by damaging or destroying individuals or reducing or degrading suitable habitat.

Although information is not available for logging plans or fuels reduction activities on private industrial forest lands, it is assumed commercial harvest will occur in the future and privately-owned forests will be in early to mid-seral stages. Sensitive species do not receive protection on privately-owned lands, but will continue to be protected and conserved on federal lands, according to BLM policies and federal regulations.

Sensitive and/or S&M plants would not be directly impacted by the activities proposed in Alternative 2 because surveys have been conducted and no Sensitive plants were located. Project design features would reduce the risk of introducing or spreading noxious weeds during project implementation, which could potentially impact Sensitive vascular plant habitat. No Sensitive Status or Survey and Manage vascular or nonvascular plants would trend toward listing (ISSSP) or cease persisting (S&M) as a result of implementing the activities proposed in Alternative 2.

The potential cumulative effect of the proposed project on Sensitive fungi would be the risk of impacting rare populations on 899 acres during thinning and fuels reduction treatments. However, the commercial thinning would occur on matrix lands, which are designated for timber production and harvest. Across the Northwest Forest Plan area, approximately 14 percent of the 8 million acres of late-successional forest are in matrix and are available for harvest, while 86 percent are designated as late-successional reserves, congressionally reserved and administratively withdrawn areas, and Riparian Reserves. It is estimated that over the next 50 years, late-successional forest would develop at 2.5 times the rate of loss through stand-replacement fires and harvest (USDA/ USDI 2004c, 107-111). This reserve system spread across the landscape is intended to provide protection and development of late seral habitat for the protection and expansion of late-successional associated rare plants. Under the Northwest Forest Plan, at least 15 percent late seral (80-plus years old) conifer forest must be maintained in each 5th field watershed (USDA/USDI 1994, p. C-44).

Because of their rarity across the Pacific Northwest Forest Plan Area, it is unlikely Sensitive fungi are present in the Fire Resiliency thinning and fuels reduction units. The risk is low that they would be impacted. The same holds true for Survey and Manage A & C fungi. It is protection of species at the landscape level that ensures Sensitive species will not trend toward listing and S&M species will persist. The assumption is made that protecting known sites (current and future found) of these Sensitive and S&M (categories A-E) fungi, in addition to conducting large-scale inventories throughout the Pacific Northwest, will be adequate in ensuring that this project and future projects would not contribute to the need to list them (USDI 2004, 5-2) or jeopardize persistence (2001 S&M Standards and Guidelines p-3).

APPENDIX 10 - MIGRATORY BIRDS

Specialist Report

Analysis of Proposed Action Effects on Birds of Conservation Concern

for the Fire Resiliency Planning Environmental Analysis

Compliance with the Executive Order To Protect Migratory Birds

Executive Order 13186 "Responsibilities of Federal Agencies to Protect Migratory Birds," (Federal Register 2001) highlights the need for federal agencies including the USDI Bureau of Land Management (BLM) to conserve migratory birds (those species listed in 50 C.F.R. 17.11) (U.S. Fish and Wildlife Service 2002) protected by the migratory bird conventions (the Migratory Bird Treaty Act [16 U.S.C. 703 – 711], the Bald and Golden Eagle Protection Acts [16 U.S.C. 668 – 668d], the Fish and Wildlife Coordination Act [16 U.S.C. 661 – 666c], and the Endangered Species Act of 1973 [16 U.S.C. 1531 – 1544. This responsibility includes the need to ensure that environmental analysis of federal actions evaluate the effects of those actions on migratory birds, "with emphasis on species of concern" (Federal Register 2001, p.3855).

"To the extent permitted by law and …in harmony with agency missions" (p.3854, Ibid.) such as the O&C Act of 1937, the Medford District Resource Management Plan (USDI 1995) and the Northwest Forest Plan (USDA/USDI 1994a); the proposed actions are consistent with "avoiding or minimizing, to the extent practicable, adverse impacts on migratory bird resources," (p. 3854, Federal Register 2001) as directed in the Executive Order mentioned above.

Birds of Conservation Concern

Table 1 below summarizes the potential effects of the proposed actions described in the Fire Resiliency Planning Environmental Analysis on the Birds of Conservation Concern known to occur on Medford District BLM managed lands.

Table **A9-1: Birds of Conservation Concern for Medford District BLM**

species	habitat	presence in Fire Resiliency Planning Area and effects
peregrine falcon	cliffs	Habitat not present in the Planning Area
olive-sided flycatcher	Green coniferous forests with snags. Habitat is relatively broken-canopied coniferous forest from sea level to Cascades up to 9,000 ft elev., containing large trees and snags (Zeiner et al 1990). Geographic distribution over W side of CA,OR,WA, intermountain West and most of Canada (Natl. Geographic 1989). Mature and old-growth coniferous stands or fragments of these with uneven, mixed-age canopies that contain occasional snags, from which it forages (Csuti et al 2001, Kemper 2002, Altman 1999)	Likely present in Planning Area, but very limited in proposed units which are dominated by younger trees and few large snags or large trees which are retained. Thinning and retaining snags and large domintant trees, and small opening created from temporary spurs or harvesting corridors may improve habitat suitability. Suitable medium and large conifer habitat would persist in Congressionally (Wilderness and National Parks) and Administratively (lands unsuitable for timber harvest) Withdrawn Lands, which total over 2.25 million acres (FEMAT 1993, Table IV-3) plus 100-acre owl cores (over 100,000 ac.[USDA/USDI 1994]); marbled murrelet LSRs; Riparian Reserves (630,000 ac [Ibid.]); and some forested lands in the following land allocations West of the Cascade crest: Mapped LSRs, many state parks; military installations, and national and state wildlife refuges. Individual home range is approximately 20 ac. (Johnston 1971 *In* Zanier 1980). Therefore, the proposed actions would have no measurable effect on population trends at a state or regional scale.
rufous hummingbird	Nests in shrubs and trees near foraging habitat including young second growth, mature and old growth conifer forests. Forages on nectar-producing flowers, which occur in early successional areas. (Healy et. al. 2006, Kemper 2002)	Present in the Planning Area. Foraging habitat present over less than 10% of areas within timber harvest units, as units are forested and not in early successional stages. Some small openings occur. Residential areas, or recent harvested area on private or BLM, natural or man-made openings may provide flowering plants. Small opening created from temporary spurs or harvesting corridors may improve habitat suitability by encouraging growth of flowering shrubs. Nesting habitat is present in some edges of units. Some nesting habitat near edges within units would be removed. But since nesting habitat suitability depends on the proximity of trees and shrubs to foraging habitat, it is likely that the proposed action would not result creation or removal of woody vegetation for foraging or nesting habitat. However, since habitat for this species is very widespread (in suburban and forested areas of NW CA, the NW 2/3 of OR and ID, all of WA and over half of BC), population trends at state or regional levels would not be affected by proposed actions.
Allens's hummingbird	breeds only along a narrow strip of coastal California and southern Oregon, in moist coastal areas, scrub, chaparral, and forests	Not expected to occur inland in the Planning Area.

	(Mitchell 2000, Kemper 2002)	
Oregon Vesper Sparrow (*affinis* ssp.)	Open habitats, favoring areas with a high percentage of bare ground and short, sparse herbs or grasses. Similar habitat to the horned lark. It selects open habitats with scattered trees or shrubs for singing perches and escape cover . (Beauchesne 2002)	Habitat not affected by proposed action units, not expected to occur in Planning Area.
bald eagle	Mature and old-growth forested areas adjacent to large bodies of water with some habitat edge, relatively close (usually <2 km)	No nesting or roosting occurs in the Planning Area and eagles not expected to be affected by proposed action.
Horned Lark (*strigata* ssp.) ESA candidate	Occurs in short-grass habitats and areas with bare ground. (Kemper 2002, USFWS 2008a)	No known sitings near the Planning Area, and not expected to occur.
willow flycatcher (non-listed subspecies or population)	Shrubby, often wet habitats, river corridors; Occurs in moderate density in early-growth clearcuts in western Oregon. In California, high foliage-volume willow cover ares, moist brushy thickets, open second-growth, and riparian woodland, especially with willow. (Kemper 2002, Sedgwick 2000, Craig and Williams 1998)	May occur within Planning Area. Proposed action not expected to reduce potential riparian or early successional conifer habitat.
purple finch	Breeds primarily in moist or cool coniferous forests. Also frequently found breeding in mixed coniferous-deciduous forest, edges of bogs, and riparian corridors. Also breeds in deciduous forests, orchards, ornamental plantations, pastures and lawns with scattered conifers and shrubs, hedgerows, and developed areas. Purple finch prefers open wooded habitats. (Wootton 1996)	May occur in Planning Area and in or near proposed units. Typically nests on conifer branches. Some nests may be lost if proposed action occurs during nesting season. Suitable conifer habitat would persist in Congressionally (Wilderness and National Parks) and Administratively (lands unsuitable for timber harvest) Withdrawn Lands, which total over 2.25 million acres (FEMAT 1993, Table IV-3) plus 100-acre owl cores (over 100,000 ac.[USDA/USDI 1994]); marbled murrelet LSRs; Riparian Reserves (630,000 ac [Ibid.]); and some forested lands in the following land allocations west of the Cascade crest: Mapped LSRs, many state parks; military installations, and national and state wildlife refuges. Therefore, the proposed actions would have no measurable effect on population trends at a state or regional scale.

Regional Strategies

Both the USDI Fish and Wildlife Service (2008) and Partners in Flight (Altman 1999) consider the state and regional approach a key to the conservation of migratory songbirds. In 1999, strategies for the conservation of the olive-sided flycatcher and the rufous hummingbird and other species were proposed in the form of a regional conservation plan for coniferous forests in Oregon and Washington. This strategy, which "represents the collective efforts of multiple agencies and organizations within …Partners in Flight," recognized the Northwest Forest Plan as an effort in the same type of conservation planning process, which approaches management at a regional level. The proposed actions are consistent with the Northwest Forest Plan, which is also designed to provide for the conservation of other forest-related species in the range of the Northern Spotted Owl, such as these songbirds.

Within the Northwest Forest Plan (24,455,300 federal acres), reserved/ withdrawn lands total approximately 78% of the federal land base (USDA/USDI 1994, p. 2-62:65). Not all of the reserves are in or will obtain late-successional forest conditions, but the majority is expected to contribute as suitable habitat towards migratory birds utilizing late successional habitat. In addition, Matrix lands (3,975,300 acres) representing about 16% of the federal land base, contain selected portions of the land managed to retain 15-30% in late-successional forest, which provides additional suitable habitat.

Allocation	Acres	Percent
Congressionally Withdrawn	**7,321,000**	**30**
Late Successional Reserves	**7,431,000**	**30**
Riparian Reserves	**2,628,000**	**11**
Administratively Withdrawn	**1,477,000**	**6**
TOTAL	**18,857,000**	**77**
Matrix land	**3,975,300**	**16**

Compliance with the Migratory Bird Treaty Act.

This act implements various treaties and conventions between the U.S. and other countries that share migratory flyways. With this proposed action, and as prohibited in the Act, there would be no deliberate take (IM OR-2009-018), possession, import, export, transport, sale, purchase, barter or offering of these activities, or possessing migratory birds, including nests and eggs.

Summary

The implementation of the proposed actions is not expected to affect the trend in populations of migratory birds, as established at a state or regional scale. Also, the proposed actions are consistent with planning documents designed to conserve songbirds at those scales.

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