

Chapter 4 - Environmental Consequences

4.0 Introduction

This chapter describes the environmental consequences of implementing any of the alternatives described in Chapter 2, including the No Action Alternative. Chapter 4 focuses on potential impacts in relationship to the key issues, important resources, uses and management actions described in Chapter 3, the Affected Environment.

The Northwest Forest Plan discusses the need to continue examining impacts from a site level perspective. “All ground-disturbing actions will be conducted only after site-specific analysis. This site specific analysis will also analyze the impacts of the project on adjacent lands and resources within the watershed, enabling managers to design, analyze, and choose alternatives that minimize cumulative environmental effects that cannot be identified at the programmatic level of the SEIS,” (USDA/ USDI 1994a, p.3-5).

The following discussion emphasizes short term impacts (approximately 10 years as identified in the NFP, and 10-20 years for this FEIS), at both the site specific level (7th field watershed) and, to a lesser degree, at the broader scale (5th field watershed). The long-term impacts, those occurring 100 years or more in the future, were extensively analysed in the Northwest Forest Plan FEIS which covered various scenarios, conditions, and potential outcomes that could be anticipated. In examining the impacts at the site level, the ID team followed the intent of the Federal Guide for Watershed Analysis which acknowledged the need for various scales of analysis. It identified the 5th field watershed level as appropriate to “provide the context for management through the descriptions and understanding of specific ecosystem conditions and capabilities,” and expected that “Analysis at the subwatershed level will tend to be more targeted at determination of potential effects of management activities rather than process or functions of ecosystems.” (RIEC 1995). The Wild Rogue Watershed Analyses (USDI 1999b, USDI 2000a) were critical in the assessment of anticipated impacts from each of the alternatives.

The analysis and description of the environmental consequences focus on issues identified through scoping (see Chapter 1), but also address impacts to other critical elements, as identified in BLM manual H-1790-1 and supplementary guidance. Discussions from previous analyses are summarized and incorporated by reference and tiering from the Northwest Forest plan (USDA and USDI 1994), Medford District Proposed Resource Management Plan/ Environmental Impact Statement (BLM 1994) and the more site specific Wild Rogue North Watershed Analysis (USDI 1999b) and the Wild Rogue South Watershed Analysis (USDI 2000a).

Direct and indirect impacts are addressed for each resource, use or management action. Table 2-1 presents a summary of the differences between the alternatives; Maps 4, 5, and 6 illustrate the spatial arrangements. Cumulative impacts are the effects on the environment of each alternative when considered with the effects of past, present, and reasonably foreseeable future actions that might occur inside and outside the project area. The potential cumulative effects of the actions are described at the end of chapter 4, and Appendix 14-1 and 14-2 identifying past actions over a period of over 60 years.

4.1 Analysis Assumptions and Guidelines

The following assumptions and guidelines were used to guide and direct the analysis of environmental consequences:

1. If selected, any of the alternatives would be implemented as described in Chapter 2, including the Management Common To All Alternatives.
2. The Bureau of Land Management would have sufficient funding and personnel to implement alternatives.

3. Current trends in management, including land use and fuels development, would continue in compliance with the Medford District Resource Management Plan (RMP) and the Northwest Forest Plan.
4. The selected action alternative would be implemented over approximately the next five years.
5. The monitoring identified within the context of the alternatives would be funded and implemented.
6. The Aquatic Conservation Strategy, as described in the RMP, and the Best Management Practices in Appendix D of the RMP, would be common to all action alternatives.
7. The environmental consequences would be consistent with those described in the RMP and Final Environmental Impact Statement (RMP/EIS), unless specifically identified in this document.
8. Clearance surveys have not been completed for all Special Status and Survey and Manage species. Required surveys would be completed for these species before a Record of Decision were to be signed. Any locations within the project area would be protected according to established direction and protocols.
9. Fire behavior predictions were calculated using the BEHAVE program (Burgan and Rothermel 1984). Worst case weather conditions were used to model rate of spread and flame length. The model is primarily intended to describe a flame front advancing steadily in surface fuels within 6 feet of, and contiguous to, the ground. More details on the fuel models used can be found in Appendix 5.

4.2 Soils

For all action alternatives, impacts to soils are within the range of those previously analyzed in Effects on Soils (pgs 4-12 through 4-16) in the Medford District Resource Management Plan Environmental Impact Statement (1994). Minor losses in productivity were anticipated, resulting from surface disturbances (soil compaction, road construction, etc.). “Implementing best management practices and minimizing disturbance of fragile areas will keep losses to a minimum,” (USDI 1994, pg. 2-26).

Coarse wood requirements by plant association would be adequate to supply soil organics after harvest activities given the silvicultural prescriptions to ensure adequate post harvest levels of coarse wood retention. All harvest units as well as proposed road locations would be on stable ground. Most harvest activity would occur on soils derived from metamorphic sandstone. Best management practices would be in place to ensure soil organics be retained and thus maintain long term soil productivity. An irreversible but negligible loss of soil resources through new road construction under Alternative 1 and 2 would occur. Nitrogen and other nutrients would be released and available to utilization by plants remaining on site during hand pile burning. The impact on soils from pile burning would be minimal and not preclude successful reforestation or release of existing remaining forest vegetation. Any affects from burning are considered well within the natural range of variability since evidence of fires in the past indicate whole 7th field watersheds were burned in the past. Nutrient availability and most of the organics would be retained during the underburn operations since those operations would occur during moist soil conditions and most of the duff would be retained as well as 100 and 1000 hour fuels.

The addition of approximately 1.5 miles of temporary road would not be expected to increase sediment levels over the long term. Temporary roads are proposed on or near ridge tops on stable locations and would be decommissioned after use. Sediment production would be expected to be minimal. Within the distances to streams, and with full use of BMPs (Ch.2), no sediment transport would be expected to impact streams (Luce and Black 2001). Of the

151 acres to be tractor/cable yarded, approximately 70 acres would be expected to be tractor yarded (1.1% of the Wild Rogue North Watershed), most of which areas have experienced past harvest activities. This tractor yarding would result in soil displacement and some sediment transport. Little or no sediment is expected to travel off-site.

Sub-soiling of approximately 25 acres of roads scheduled for decommissioning would result in some sediment movement but would be minimized through mulching and the placement of waterbars. Sediment levels would be less than current levels if decommissioning and other road improvements are executed. Subsoiling along with construction of waterbars has been effective in improved infiltration and reduction in sediment transport. BLM acknowledges that some reports have indicated that ripping is ineffective at reducing compaction and improving infiltration. Studies on the effectiveness of a winged subsoiler, however, on rates of soil compaction show close to 80% amelioration (Davis, 1990). BLM personnel have found that this is a very effective method of restoring productivity to previously compacted ground, i.e., tractor trails.

Soils are further addressed below, under section 4.3, as soil relationship to hydrologic impacts and function are virtually inseparable, and under section 4.9 which discusses the transportation system and road treatments.

4.3 Hydrology

4.3.1 Wetlands, Floodplains, and Riparian Zones

There would be little or no direct or indirect impacts on riparian or wetland resources. Those areas would be directly maintained or enhanced under any of the alternatives. The Aquatic Conservation Strategy of the Northwest Forest Plan would be fully implemented. Precommercial thinning (PCT) in riparian reserves would be used to accelerate the rate of growth of conifer species and to reduce fire hazard. Silvicultural activities would occur under all alternatives for forest health reasons. Burning of piles would also occur in riparian zones near roads to reduce ignition sources of slashed material. Prescriptions for PCT activities would require a 25 foot setback from stream channel.

Since the stream channels are hill-slope constrained and there is currently no flood plain development, there would be no effect on this element from any of the proposed alternatives. Under all alternatives the Aquatic Conservation Strategy of the Northwest Forest Plan would be implemented to ensure integrity of the streams and Rogue River.

Precommercial thinning (PCT) activities within the riparian management areas would not occur within 25 feet of the channel, thereby maintaining current shading and facilitating more rapid growth of larger trees in the thinned areas. Activities for PCT under this proposed action would be located on the upper slopes, and involve spacing and brushing near 1st and 2nd order streams with channel widths of 1 to 4 feet. These channels are currently well shaded and would continue to be so after the action were completed. Because of this, the water temperatures are expected to be maintained. It is also likely that long-term large wood recruitment would be improved by PCT in these areas. Pine retention activities in Whisky Creek drainage would not be expected to impact water quality parameters since there would be adequate buffering of channels (see section 2.4.5 Forest Health), protecting current shading and filtration along those narrow headwater streams. Commercial thin activities that are adjacent to streams in West Fork Whisky Creek are likely to have little or no direct or indirect impacts on riparian zones as riparian reserves one to two site potential tree heights in width and directional felling would be utilized to ensure full compliance with the ACS.

There are no activities currently planned that would affect water sources for domestic use in the planning area. The BLM has no ground water injection facilities within the planning area.

4.3.1.1 Transient Snow Zone

Map 34 of the Wild Rogue North Watershed Analysis displays the Transient Snow Zone (TSZ). Analysis of open area for determination of rain on snow events was conducted for each alternative and then compared between alternatives. Open area calculations were derived from non-forested areas, stands less than 30 years old and estimated open area as a result of timber harvest activity in proposed stands. Under Alternative 3, the existing condition, 91 percent covered area at the HUC 5 level, would not be expected to appreciably change over the short term. The same would be expected under Alternative 4. Under Alternatives 1 and 2, covered area could be expected to be reduced to 90 percent.

Because Endangered Species Act consultations with NOAA Fisheries are conducted at the 6th field watershed level, some discussion is included here on anticipated impacts at that level. The analysis of the existing conditions at the 6th field watershed level indicated that all subwatersheds within the planning area would remain above 84 percent covered under Alternative 1. Eighty-six percent would be retained under Alternative 2, remain unchanged pending future regeneration harvest under Alternative 3 and likely to change very little under Alternative 4; probably less than 1 percent change due to thinning activities. The area of Whisky Creek is about 15,083 acres, Bunker Creek 16,352 acres, Meadow Creek 11,346 acres and Kelsey Creek 11,545 acres.

The existing conditions at the seventh-field subwatershed level indicated that all of these subwatersheds within the FEIS area would remain above 80 percent under Alternative 1.

Analysis of the current openings in the transient snow zone in Kelsey Creek (HUC 6) indicate that about 87 percent of the area is over age 30 and canopy covered. After harvest, the covered area would be reduced to about 80 percent. This includes regeneration harvest units planned in Kelsey Creek above North Fork Kelsey Creek (units 23-A1, 26-A, 26-A1, 27-3 and 27-4) and East Fork Kelsey Creek (units 5-1, 6-4, 6-5, 1-2, 7-1, 1-1, 31-1, and 35-1) subwatersheds. No channel destabilization events are anticipated as a result of timber harvest in these tributaries or downstream in main stem Kelsey Creek under Alternative 1. Effects under Alternative 2, 3 and 4 would be less than described in Alternative 1.

Surveys by the Oregon Department of Fish and Wildlife (ODFW) and BLM revealed hill slope constrained channels with a high gradient (i.e., greater than 10 percent). The adjacent slopes are stable and vegetated and the channels are moderately stable at the present time. Given that open space in the past was much greater than current conditions due to fires, the channels are likely of adequate width and depth to handle flows without any undue channel changes. See Appendix F of the Wild Rogue North Watershed Analysis (USDI 1999b).

Openings within the TSZ would be about 2 percent less than Alternative 1, under Alternative 2. Under Alternative 4 the percentage change from current conditions would remain relatively changed. This reduction is a result of reduced regeneration harvest activity under Alternative 2 and no regeneration activity under Alternative 4. Alternative 3 would remain unchanged.

4.3.2 Water Quality

Water quality would be protected through adherence to the Aquatic Conservation Strategy as described in the Medford District Resource Management Plan and in the project design features described in Chapter 2. See section 3.3.2 for a discussion of the water quality restoration plan development. Consistency with this strategy has been analyzed and can be found in Appendix 11 (cf 4.9.4 - Fisheries).

Road maintenance, road building and decommissioning of roads would likely produce above background levels of sediment during the first few rains of the fall season. This would be true for all action alternatives. Long term benefits would be expected from decommissioning roads under all alternatives. The natural hydrologic conditions would be improved within the watershed through subsoiling, outsloping and waterbarring, reducing impacts of roadside ditch drainage. Outsloping and water dipping the existing roads that remain in use would

further reduce current erosion problems. Alternative 4 would have the greatest positive impact on hydrologic functions, with 13.6 miles of road decommissioned and 5.08 miles closed with gates. Road bed erosion and possible culvert washouts would be most likely under Alternative 3.

In developing the WQRP, elements of a sediment monitoring plan would be prepared. A time frame would be established for the monitoring to demonstrate whether road maintenance, construction and decommissioning would have an appreciable effect on sediment production. None of the creeks in the Wild Rogue Watershed are listed by DEQ for high sediment levels.

Both Alternative 1 and Alternative 2 would likely result in some unquantified sediment transport in the immediate vicinity of the disturbance caused by road building. It is unlikely to have any effect on streams since the road locations are ridge top and upper slope and avoid unstable areas. Sediment generated by construction activities would not be expected to move more than 100 feet off site (USDA 1989). In compliance with the RMP, straw mulching exposed areas, installation of water dips, surfacing roads and gating of other roads in the area are all efforts that would be employed to stop or minimize sediment transport to streams. Yearly monitoring would occur on all new construction activities. These Best Management Practices were identified in the RMP as the mitigation for impacts of new roads (USDI 1995, Appendix D). The BMP effectiveness monitoring would be included in the WQRP to determine whether the BMPs for sediment are effective.

Under Alternative 3 roads would continue at their current assigned maintenance level (Appendix 3). The indirect effects of this alternative would be to allow for continued erosion activity. Maintenance currently focuses on through roads (Back Country Byway, Glendale/Power Bike Route). Current maintenance levels are minimal and may lead to culvert failures to a higher degree than if roads were maintained or renovated or decommissioned.

No alternative presented here would affect Mule Creek or Whisky Creek or cause other streams to be added to the current list of 303d limited streams. These two streams would continue to be monitored. Temperature regimes in all of the streams are likely to be maintained over both the short term and long term since full ACS compliance has been prescribed for all action alternatives (Appendix 11).

The acreage of disturbed soils as a result of decommissioning of existing jeep and haul roads was calculated for each alternative. No decommissioning would occur under Alternative 3. About 25 acres of disturbance would occur in Alternatives 1 and 2 and up to about 35 acres in Alternative 4. Ripping of the road surface with a winged subsoiler normally results in little surface disturbance. Actual disturbance levels would vary from site to site and erosion would be minimal. Observations have indicated little or no sediment production following subsoiling of other roads and compacted ground within the Glendale Resource Area (Mackin Gulch Timber Sale and others), when used in conjunction with water-barring and mulching. The long-term benefit of decommissioning helps to restore the natural hydrologic functions of infiltration and dispersed runoff into natural drainages.

4.4 Vegetation

4.4.1 T&E, Special Status, Survey & Manage

Alternatives 1, 2 and 4

Gentner's fritillary is listed as endangered under the Endangered Species Act. Although it has been found in the Glendale Resource Area, the Wild Rogue watershed is outside of its range as determined by the USFWS. No effects to threatened or endangered plants are anticipated under any of the action alternatives.

Fuels units which host the Bureau Sensitive species Rogue River stonecrop are scheduled for a slash, pile and burn treatment. Although this treatment may adversely affect Rogue River

stonecrop by increasing the potential of local extirpation, the presence of fire may benefit the species (Kimmins, 1987). Anecdotal evidence suggests species occurring with habitats such as that of Rogue River stonecrop respond well to the presence of fire. As the scientific community as a whole could benefit from additional information relating to Rogue River stonecrop and the presence of fire, some of the sites will be treated through on an experimental basis. Rogue River stonecrop is commonly found in areas adjacent to the project area. Thus, if the viability of isolated populations is threatened, an adverse affect to the metapopulation as a whole is not anticipated.

The Bureau Sensitive species Oregon bensoniella occurs within the boundaries of a fuel unit which is scheduled to be underburned. Like Rogue River stonecrop, the presence of fire may or may not negatively affect the species. Oregon bensoniella occurs in wetland habitats, which are often difficult areas to burn. Therefore, an underburn producing heat intense enough to jeopardize the species is unlikely. In addition, sub-populations of Oregon bensoniella occur throughout the resource area, so a negative cumulative affect to the metapopulation as a whole is not expected.

Bureau Assessment Species such as wideleaf crumia moss, Muhlenberg's funaria moss, birdfoot cliffbrake, red larkspur, and stipuled trefoil all occur in units scheduled for a slash, pile and burn treatment. With the exception of stipuled trefoil, each of these species occurs on rock outcrops. Because piles are located on the ground, a negative affect resulting from the fuels treatment is not expected to adversely affect these Bureau Assessment species. These sites will be protected on a site-by-site basis; determination for protection will be based on relative species abundance, microsite conditions, and the presence of other populations within the resource area.

Tripterocladium moss was found in timber units 27-3 and 1-2. Like the rest of the BAO species, protection of this species will be determined on a site-by-site basis using the criteria described above.

Several other species of vascular plants have been found in the planning area are suspected in the project area (Appendix 6). Clustered lady's slipper and California wild hollyhock have not been found in the watershed, but occur nearby and are suspected in the project area. Clustered lady's slipper is an interior forest species which requires inclusion of a large enough area to maintain current habitat and microclimate conditions. The planning area has been surveyed extensively in 2002.

The most intensive prescriptions would leave about 10-15 percent canopy cover, which would reduce the depth of but not eliminate any edge effects. Microclimate measurements show that interior conditions may not be found until 100 to over 790 feet from clearcuts or agricultural fields, depending on site conditions and weather, and the variable measured (Chen 1991, Rodrigues 1998). Some of the smaller microclimate differences appear to be irrelevant to biological systems, as edge effects on biological variables, such as plant regeneration and species composition, generally average around 200 to 250 feet, with a range of 50 to 450 feet, adjacent to cleared areas (Chen 1991, Rodrigues 1998, Jules 1997). Known locations of special status and Survey and Manage plants would be protected with at least 100-foot no-cut buffers, up to 200-foot buffers in regeneration and overstory removal units that would retain less than 40 percent canopy cover. Thinning prescriptions leave up to 60 percent canopy. The buffers would exclude disturbances such as road construction and fuels treatments. Burning would be excluded from the buffers as some plants may be killed by direct heat. Some species which appear to prefer more open habitats, and may benefit from fire (e.g., McNeal Bolander's onion, Bald Mountain milkvetch, California glob-mallow may have prescribed underburns within the buffers, on an experimental basis.

The direct effect of fire on each individual species is unknown. Cumulative effects for species which occur in and are included in prescribed burn areas are negligible or positive, as metapopulations as a whole will not be adversely affected. For those S&M and BSO sites which occur in fuels units, buffer width may vary according to microclimatic conditions and prescription.

Based on the numbers in the literature mentioned above, and with the project design features relative to the actions proposed under Alternatives 1, 2, and 4, the proposed buffers in all

action alternatives would provide adequate micro site conditions to maintain the population at the site. Some populations of species which do not require protection, such as Bureau Tracking Species, have the potential to be extirpated by these same actions.

Alternative 3

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

4.5 Fire and Fuels

Fuels management activities generate particulate pollutants in the process of treating natural and activity related fuels. Smoke from prescribed fire has the potential to effect air quality within and surrounding the planning area. Table 4-1 displays the expected emission amounts of particulate matter produced from burning under the alternatives. The use of prescribed fire for ecosystem restoration can produce enough fine particulate matter to be a public health and/or welfare concern. Fine particulate matter in smoke can travel many miles downwind impacting air quality in local communities, causing a safety hazard on public roads, impairing visibility in class I areas, and/or causing a general nuisance to the public. If properly managed, most negative effects of prescribed fire smoke can be minimized or eliminated. All action alternatives propose treatments to reduce fire hazard and decrease long-term adverse cumulative effects. This opportunity to reduce fire hazard would not occur under Alternative 3.

The use of drip torches to ignite handpiles or underburns would pose little to no risk of ground water contamination. Drip torches are hand held canisters containing slash fuel (mixture of diesel and gasoline). Handpiles are ignited by tipping the drip torch allowing slash fuel to

Table 4-1. PM-10 and PM-2.5 emissions anticipated for the project area by prescribed fire treatment type and alternative.

	Alternative							
	1		2		3		4	
	Preferred PM-10	PM-2.5	PM-10	PM-2.5	No Action PM-10	PM-2.5	PM-10	PM-2.5
Non-Commercial Fuels Treatments								
Pile Burning	195	169	193	168	-----	-----	189	164
Underburn	157	143	157	143	-----	-----	157	143
sub-total	352	312	350	311	-----	-----	346	307
Pile Burning	195	169	193	168	-----	-----	189	164
Underburn	157	143	157	143	-----	-----	157	143
sub-total	352	312	350	311	-----	-----	346	307
Commercial Fuels Treatments								
Pile Burning	26	22	26	23	-----	-----	25	22
Underburn	100	91	100	91	-----	-----	57	52
Broadcast Brun	124	111	69	62	-----	-----	-----	-----
sub-total	250	224	195	176	-----	-----	82	74
Total	602	536	545	487	-----	-----	428	381

pour out the spout through a wick, which ignites the fuel as it leaves the torch. The fuel is dripped into the center of the handpile to ignite the cured vegetation. The slash fuel is consumed as it leaves the torch or will burn in place if it lands on the ground. The potential for fuel to seep into ground water supplies is minimized through the flaming consumption of the fuel and also through the minimal amount of fuel which is utilized to conduct prescribed burning.

Alternatives 1, 2, and 4

In the short term, logging would create fuel loadings on the ground which would be greater than current levels if they are not treated. Fuel amounts are measured in tons per acre for different size material. Material up to 3 inches in diameter has the greatest influence on the rate of spread and flame length of a fire, which has direct impacts on fire suppression efforts. It is anticipated that fuel loadings after thinning, if left untreated, would be increased by approximately 10-15 tons per acre. This would change the existing fuel model of most of the timbered stands from a timber litter fuel model 8 to a slash fuel model 11, which has a higher rate of spread and greater flame lengths. Regeneration harvest units would see an increase of 20-35 tons per acre and would be represented by a slash fuel model 12. These units would exhibit even higher rates of spread and flame lengths than the thinning units.

In stands identified for harvest, removal of smaller trees would reduce ladder fuels. Reducing canopy cover to 60 percent would reduce (but not completely eliminate) the potential for running crown fires. The ladder fuel induced crown fire potential would also be reduced. In stands identified for regeneration harvest, the reduction of heavy ground fuels would reduce fire hazard. The potential for a large fire occurring is reduced as stand density is reduced. Timber harvest would break up the vegetation and create a mosaic of age and size classes across the landscape. A mosaic of stand types would limit the potential of high intensity fires from burning entire drainages since this condition would slow the spread of fire and allow direct attack by hand crews (flame lengths must be less than 4 feet to allow direct attack).

Under Alternatives 1 and 2, all timber harvest projects would include fuels and slash reduction treatments in harvest units (Table 4-2). This has not always been the case in previous timber harvests located throughout and adjacent to the Kelsey Whiskey Planning Area. Initially, there would be an increased fire risk following timber harvest activities. However, upon completion of post harvest slash reduction treatments, harvest units would have less slash and a reduced fire risk and hazard than treated units of the past.

Table 4-3 displays the associated changes in fire behavior due to a reduction in the dead, down woody material after the fuels have been treated. Rate of spread (ROS) of a fire on south slopes and ridge tops, represented by fuel model 2, would increase due to a change in the fuels. Harvest and fuels treatments would open the canopy and encourage the growth of grasses and forbs. These light, flashy fuels allow fires to burn faster than would larger fuels such as down, woody material. Although wildfire spread rates may increase, fires would be easier to control. Moist north slopes are represented by fuel model 8 and plantations are represented by fuel model 6 after treatment.

Treatments on dry, low-elevation sites and south-facing aspects, such as canyon live oak, and ponderosa pine, would reduce the existing high fuel hazard conditions. The risk of high fire intensities would be reduced if a wildfire would occur.

Establishing fuel modification zones (FMZs) along strategic ridge lines would meet several objectives. Crown fires would be less likely to start within these zones. Crown fires which originate outside of and burn into these zones would be less likely to continue to burn in the crowns, due to the wider spaced canopies within the FMZ. These zones also would provide a greater opportunity to stop the spread of a wildfire and keep it from burning the entire planning area.

FMZs would also provide an area which would be safer than what currently exists for wildfire suppression efforts. The FMZ would allow for rapid deployment of personnel and equipment which would help in reducing the size of wildfires. Firefighter safety has always been an issue but has gained more attention over the past years because fires are becoming larger and

Table 4-2. Acres of fuels treatments in the Kelsey Whisky project area.

Treatment	Alternative			
	1 Preferred	2	3 No Action	4
Non-Commercial Fuels Treatments				
Slashbuster (MFT)	289	289	-----	302
Manual (SL,P)	1,847	1,823	-----	1,784
Underburn (UB)	1,129	1,129	-----	1,129
subtotal	3,265	3,241	-----	3,215
Commercial Fuels Treatments				
Slashbuster (MFT)	51	51	-----	51
Manual (SL,P)	1,829	1,751	-----	1,659
Underburn (UB)		457	457	1,659
Broadcast Burn (BB)	350	283	-----	261
Subtotal				1,971
Grand Total	5,952	5,783	-----	5,186

Table 4-3. Expected changes in fire behavior following fuels treatment by alternative.

Aspect	Alternative							
	1 Preferred		2		3 No Action		4	
	ROS	FL	ROS	FL	ROS	FL	ROS	FL
Dry South Slopes and Ridge tops	87	10	87	10	371	42	87	10
Moist North Slopes	6	2	6	2	19	8	6	2

ROS = Rate of Spread (ft/min) FL = Flame Length (ft)

more difficult to control due to the high accumulation of fuels throughout the western United States. As fires become more difficult to control and the concern of firefighter safety increases, more indirect fire suppression measures will be taken which will lead to more acres burned. This trend could be slowed and eventually reversed with the treatment of fuels which exist in the Kelsey Whiskey Planning Area along with the establishment of Fuel Modification Zones. These areas could also be used as control lines for future underburning of high risk and high hazard areas, which would further reduce the fuel hazard of the planning area. The impact of developing these FMZs would be the requirement to keep them clear of undergrowth every 5 to 10 years.

Typically, flame lengths of 2-4 feet are expected in the underburn units. The broadcast burn units are expected to exhibit more intense fire behavior, with 4-6 foot flame lengths, due to the high fuel loading in these units. The majority of fuel created and consumed by the proposed action would be 3 inches and less in diameter. These fuels typically burn out relatively fast with little heat transfer to soils with rapid burn out. This may result in less scorch and mortality to the residual stand in underburn units. Although some mortality is expected in the smaller diameter size classes as a result of the burn, the hazard to the remainder of the stand would be reduced.

Full fire suppression would continue throughout the entire planning area in Alternative 1 and most of the area for alternatives 2 and 4. In Alternatives 2 and 4, fire suppression in the area proposed for an ACEC would be done with limited use of mechanized equipment such as dozers or tractor lines. Heavy equipment would stay primarily on existing ridge roads. This strategy may create the potential of permitting a wildfire to grow larger than if a full suppression strategy were implemented.

Alternative 3

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

Without the establishment of the Fuel Modification Zones along the major ridge lines within the planning area, the chances of a fire which starts within the planning area being larger and burning more intense is greater. There is a greater chance that a wildfire which starts outside of the planning area will burn into the Kelsey Whiskey Planning Area. Crown fires which originate in adjacent stands and burn into the Fuel Modification Zones are less likely to continue to burn in the crowns due to the low percent canopy closure. The lower the percent canopy closure the more effective these zones will be. Firefighter safety is the number one priority when it comes to fire suppression efforts. If the trend of not treating accumulating fuels in our forest continues, wildfires will increasingly become more difficult and dangerous to suppress.

Untreated areas in all alternatives would perpetuate current conditions and in many mature stands, growth and deterioration would increase fuel loading. These conditions over time would increase the potential for a stand replacement fire within or adjacent to the planning area. Existing high hazard conditions would continue in brush fields, areas with light, flashy fuels (south-facing slopes), and overstocked stands with ladder fuels. Continued fire suppression activities would allow pole-sized Douglas-fir and hardwoods to grow underneath large, overstory conifers, creating very dense stands that are prone to stand-replacing fires under extreme weather conditions. Fuel model 8 was used to represent plantations, model 4 was used to represent south slopes and ridge tops, and model 11 was used to represent fire behavior on moist north slopes in Table 4-3. Flame lengths and rates of spread are expected to be higher in alternative 3 due to a build up of down, woody fuels. Plantations are the exception because the canopy would remain closed and would not permit grasses to grow. The only fuel that would be on the ground to burn would be small twigs and needles from the overstory.

As the vegetation along maintenance level 2 and 3 roads grows in without maintenance treatments, access for firefighting crews would diminish. This could increase the amount of time it takes for initial attack resources to reach a fire, which might ultimately result in larger fires. A decrease in road access and a simultaneous increase in ladder fuels would increase the probability of a large, intense wildfire. This could lead to a greater chance of losing late successional habitat to wildfire events.

As recreational use increases in the analysis area, there may be a slight increase in the risk of human-caused wildfire occurrence, especially along major roads.

4.6 Timber Management

4.6.1 Acres Available for Timber Production

In the RMP lands were allocated (USDI 1995, p.32) in order to meet both short and long term land management objectives. The allocations within the EIS area are LSR, Riparian Reserves, Congressional Reserves, and Matrix. Matrix lands include General Forest Management Lands and Connectivity Blocks. While Matrix lands have as primary objective the production of a sustainable amount of timber (USDI 1995, p. 38), they have other objectives such as contributing to connectivity across the landscape.

Within the Matrix there are other lands that are also not allocated to planned timber harvest. These other lands include: lands of very low productivity; lands which are not forested, such as rock outcrops and roads, and lands that may have slope instability as a result of their steepness. As a result, lands that have the broad classification of Matrix are not entirely available for planned timber harvest. Available acres are those that have been modeled for and are managed for long-term sustainable timber production (Map 13). Table 4-4 depicts the gross Matrix acreage and the net acreage available for timber harvest. The Medford District BLM has 589,929 gross acres of Matrix of which only 190,995 (32%) are available for timber harvest

Table 4-4. Gross Matrix Acres and Net Matrix Acres Available for Scheduled Timber harvest* within the Kelsey Whisky Project Area by Alternative.

	Alternative			
	1 Preferred	2	3 No Action	4
		Gross Acres		
GFMA	21,899	20,599	21,899	19,475
Connectivity/Diversity Blocks	1,258	1,258	1,258	1,258
Total Matrix	23,157	21,857	23,157	20,733
		Net Acres		
GFMA	9,706	9,236	9,706	8,613
Connectivity/Diversity Blocks	502	502	502	502
Total Matrix	10,208	9,738	10,208	9,115

*-Note: all acres do not currently contain stands that fit RMP criteria for harvest

Alternative 1 would allow access to the full Matrix acreage available for planned timber harvest that is currently available under the RMP. Under Alternatives 2 and 4, the creation of the proposed East Fork Whiskey Creek ACEC would restrict timber harvest, with an anticipated decrease in available volume of approximately 140,000 board feet under Alternative 2 and 325,000 board feet under Alternative 4. This is a relatively minor amount, and would not affect the Medford District’s Annual Sale Quantity (ASQ). Map 13 clearly depicts the area currently unavailable for timber harvest. Alternative 3 has no entries planned at the current time. Harvest entries would be planned in the future however to meet RMP commitments for wood volume.

4.6.2 Timber Production

Each of the action alternatives propose treatments that would result in logs being made available for local economies. Some treatments have as their objective the production of timber. These treatments would immediately result in logs being removed from the site to mills for processing. These treatments would also help to regulate natural stands through placing the stands in a condition where there would be higher degree of predictability in future growth and yield. These treatments would occur on available Matrix acres. Volume produced from these Matrix acres would be attributable to the District’s PSQ. Other treatments have different objectives, including: increase in growth rates so that large structural elements (standing trees, snags, coarse woody debris) would develop faster; creation of desired stand characteristics and structure; improvement of tree vigor; and removal of ladder fuels. These treatments would generally occur within reserves. Logs produced from reserves would be considered a by-product of the treatment and would not be counted toward the PSQ. Table 4-5 depicts the estimated merchantable volume that would be produced under each of the alternatives and the amounts that may or may not be attributed towards the PSQ under the four alternatives.

Of the action alternatives, the volume attributable to the PSQ would be greatest under Alternative 1 (10,300-12,550 MBF) and least under Alternative 4 (3,150-3,850 MBF). The amount of volume not attributable to the PSQ would be essentially the same. The total volume resulting from the action alternatives would be greatest in Alternative 1 (11,000-13,400 MBF) and least in alternative 4 (3,850-4,700 MBF). The No Action Alternative would result in no volume being produced during this entry or series of entries.

While the volume produced from these proposals would differ in the short term under each of the alternatives, the volume produced from the net available acres over the long term, assuming current standards and guidelines, would be approximately the same for Alternative 1 and Alternative 3, the No Action Alternative, as there would be no proposed deviations from the RMP in the acreage available for planned harvest or in the management of those lands. Timing of harvest treatments is the only major variable between these two alternatives. If there were any differences at all, Alternative 1 would produce slightly higher volumes over the long term than the No Action Alternative, as older slower growing stands would be replaced by faster growing young stands through regeneration harvests and growth rates of

Table 4-5. Estimated Timber harvest levels (MBF)*

	Alternative			
	1 Preferred	2	3 No Action	4
Attributable to PSQ	10,300-12,550	7,850-9,600	-----	3,150-3,850
Not Attributable to PSQ	700-850	700-850	-----	700-850
Total	11,000-13,400	8,550-10,450	-----	3,850-4,700

*MBF = thousand board feet

retained trees within commercial thins and density management units would increase as a result of those treatments. Long-term, implementation of Alternatives 2 or 4 would result in a minor decrease in volume produced when compared to the other alternatives primarily because of the decrease in the net available Matrix lands caused by the creation of a proposed ACEC in Alternatives 2 and 4.

4.6.3 Roads/Transportation System

Alternatives that build roads and maintain transportation systems in a drivable condition aid timber stand management work. While the RMP makes similar basic reforestation and stand management assumptions for like units, units that are accessed directly from roads have a greater probability of meeting or exceeding those assumptions. Units accessed by roads are likely to receive more effective site preparation after timber harvest. This is particularly true if the road serves as the holding line when the site preparation is done by broadcast burning. Initial tree planting would be about the same whether a unit has road access or not. The results of replanting, if needed, would also be about the same. Interplanting to bring marginally stocked units to target levels would, however, be less likely to occur. Follow-up treatments on units accessed by road are also likely to be more timely and effective than on units requiring a walk-in. Costs associated with forest development work done within units are less for units that crews can drive to than for those that require lengthy walk-ins. There is also better and more frequent monitoring (surveys) when units are along roads. Neither Alternative 1 or 2 have significant road building planned, and Alternative 3 and 4 have none (Table 4-6).

Whereas road building and maintenance aids timber management on a stand by stand basis, decommissioning roads that are no longer needed for access is positive from an overall timber management standpoint as acres are returned to timber production. Existing roads proposed for decommissioning under any of the alternatives do not limit unit access. Alternative 4 would decommission the greatest length of road followed by Alternative 2, 1 and the No Action. Table 4-6 depicts the miles of road maintenance, miles of temporary and permanent road construction, and miles of road proposed for decommissioning. The return of the roadbed to timber production would be incremental and of little significance by itself. Added to roads already closed (see Appendix 15) and future roads that can be expected to be closed over time, there may be some cumulative benefit over the long term.

4.6.4 Harvest Method

The harvest method used may influence the future management of units that receive regeneration harvest (RH) and overstory removal (OR) treatments. The alternatives propose varying amounts of cable, tractor, and helicopter yarding on regeneration harvest, overstory

Table 4-6. Miles of Road Maintenance, Construction, and Decommissioning by Alternative.

	Alternative			
	1 Preferred	2	3 No Action	4
Reestablish Original Road Prism	7.4	----	----	----
Outsloping with water dips	----	7.4	----	7.4
Road Renovation	7.1	7.1	----	7.1
Temporary Road Construction	1.5	1.9	----	----
Permanent Road Construction	----	----	----	----
Decommissioning		9.7		9.7
(approx. # acres return to timber production)	(18.8)	(18.8)	----	(26.4)

removal, commercial thinning, and density management harvest units. Harvest methods were based on a consideration of objectives for the land use allocation and alternative, stand conditions, site conditions and to some extent economics.

Cable yarding with partial suspension creates more surface disturbance than helicopter yarding because logs are pulled across the unit during yarding. Vegetation is broken and uprooted. Less cutting of undesirable vegetation is needed for site preparation. Disturbed vegetation dries more thoroughly than intact vegetation and therefore tends to burn more completely during site preparation. Cable corridors are cleared of vegetation and slash. Roads that give access to the yarder facilitate broadcast burning for site preparation. Tractor yarding of units produce some of the same conditions. Helicopter yarding of units does not produce the disturbance that cable yarding does. In overstory removal units, especially those where the existing conifer understory is greater than two to three feet tall, surface disturbance is generally not beneficial to retaining the conifer understory. For both types of units how well initial plantings, interplantings or existing regeneration grow determine how much additional money must be spent to achieve target stocking levels. The better the site preparation generally the more successful the initial planting will be and the greater amount of control of competing vegetation. The degree to which initial planting succeeds and how much initial vegetation there is contribute greatly to future treatments. The more successful the initial planting and initial control of competing vegetation are, the fewer treatments are needed to reforest. Table 4-7 depicts the variation of yarding methods and treatment types by alternative.

Although there are some differences in how the various harvest treatments are accomplished, the only treatment types where there is much of a difference between the alternatives is for regeneration harvests and overstory removals. The proposed yarding method in Alternative 1 is primarily cable and tractor. Under Alternative 2 there would be a shift to the greater use of helicopters. In Alternative 2 there are also fewer acres proposed for regeneration harvest or overstory removal. Because of the lack of disturbance from the yarding process that is proposed for units under Alternative 2, per acre reforestation costs would tend to be higher than in Alternative 1. Alternative 4 does not have regeneration cuts or overstory removals. Harvest method type is essentially consistent for Commercial Thin, Commercial Density Management, and the Pine Enhancement/Maintenance Treatments.

Unit layout is also a contributor to how timber stands are managed in the future. How unit boundaries are situated on the ground often determines how adjacent units will be yarded, what type of site preparation will be done, and in some cases even whether or not adjacent units will be harvested. From the standpoint of leaving manageable units for the future and not reducing management options Alternatives 1, 3, and 4 are equal. Alternative 2 is the only alternative that reduces management options on GFMA acres because of a unit's shape. Unit 13-1 is reduced in size for wildlife reasons in Alternative 2. Only the upper portion of the unit that is proposed for a regeneration harvest in Alternative 1 is proposed for a regeneration harvest in Alternative 2. Harvesting only the upper portion of the unit has the effect of almost entirely eliminating the cable yarding and broadcast burning options for the lower part of the unit at a future date as there would be a young stand above the unit that would be put at risk from those treatments.

4.6.5 Forest Health and other Non-Timber objective treatments

All action alternatives propose treatments designed to achieve non-timber objectives such as improving stand vigor, increasing tree resistance to insects and disease, increasing growth rates so that large structure develops more rapidly, reducing ladder fuels, and opening the forest canopy so that the danger of running crown fires is reduced. Table 4-8 depicts the acreage proposed by alternative of treatments designed to increase vigor, increase rates of growth, and achieve fire/fuels objectives where a commercial product (CDM, CDM/NDM) would result. The table does not include proposed fire/fuels treatments where no commercial product would result. These non-commercial treatments are described in the fire/fuels section of the document.

Table 4-7. Yarding Method within Treatment types by Alternative.

	Alternative			
	1 Preferred Acres / %	2 Acres / %	3 No Action Acres / %	4 Acres / %
Regeneration Harvest				
Cable	280 / 55%	133 / 40%	----	----
Cable/Helicopter	75 / 15 %	49 / 15 %	----	----
Cable/Tractor	113 / 22%	104 / 32%	----	----
Helicopter	42 / 8%	42 / 13%	----	----
Tractor	----	----	----	----
Overstory Removal				
Cable	21 / 45%	27 / 100%	----	----
Cable/Helicopter	26 / 55 %	----	----	----
Cable/Tractor	----	----	----	----
Helicopter	----	----	----	----
Tractor	----	----	----	----
Commercial Thin				
Cable	698 / 75%	714 / 74%	----	700 / 73%
Cable/Helicopter	122 / 13 %	122 / 13 %	----	122 / 13 %
Cable/Tractor	51 / 6%	51 / 5%	----	51 / 5%
Helicopter	56 / 6%	82 / 8%	----	82 / 9%
Tractor	----	----	----	----
Commercial Density Management				
Cable	103 / 31%	103 / 31%	----	103 / 31%
Cable/Helicopter	51 / 16 %	51 / 16 %	----	51 / 16 %
Cable/Tractor	37 / 11%	37 / 11%	----	37 / 11%
Helicopter	137 / 42%	137 / 42%	----	137 / 42%
Tractor	----	1 / < 1%	----	----
Pine Enhancement/Maintenance – West Whisky				
Cable	----	----	----	----
Cable/Helicopter	561 / 100 %	561 / 100 %	----	561 / 100%
Cable/Tractor	----	----	----	----
Helicopter	----	----	----	----
Tractor	----	----	----	----

Table 4-8. Acres of Forest Health and other Non-Timber Objective Vegetation.

	Alternative			
	1 Preferred	2	3 No Action	4
Commercial Density Management; Commercial Density Management/ Non-Commercial Density Management	328	329	-----	328
Non-Commercial Density Management	105	181	-----	181
Pine enhancement/Maintenance (West Fork Whisky Creek)	1,091	1,091	-----	1,105
Conversion: Pine to Douglas-fir (Quail Creek Fire)	221	221	-----	221
Total Acres of Treatment	1,745	1,822	-----	1,835

All the action alternatives propose to treat a very similar acreage. The action alternatives propose to accomplish an equal number of acres of non-commercial density management treatments and an equal number of acres treated to convert the pine stand resulting from the Quail Creek Fire to a stand dominated by Douglas-fir.

In Alternative 4, Unit 35-4 (a 1-acre unit surrounding a very large Douglas-fir referred to as the “ugly tree”) would not receive a commercial density management treatment but would receive a fuels treatment. The objective is to protect this unique tree by reducing the potential for wildfire to get into the crown.

Alternative 4 proposes to treat a slightly larger number of acres (14) with a treatment designed to enhance the vigor of large pines so that they can be maintained in the ecosystem. The difference in acres is the result of how Unit 4-2 would be treated. In Alternative 1 the unit would receive a regeneration harvest. In Alternative 2, where there is an emphasis on maintaining SW-NE connectivity, the unit would receive a commercial thin. In Alternative 4 the unit would receive the pine enhancement/maintenance treatment, that is specifically designed as a forest health treatment. Treatments in Alternatives 1 and 2 are designed to produce commercial products.

All action alternatives propose to treat an equal number of acres at Quail Creek. The objective of the treatment would be to shift species dominance within the young stand from the ponderosa pine that was planted after the Quail Creek Fire to Douglas-fir so that the area which is LSR would more closely resemble nearby natural stands. All acres would not be treated at the same time.

Commercial thinning, although not designed solely for forest health or other non-timber objectives, many of the same benefits would result, with competing trees being removed from stands and remaining trees then receiving more light, nutrients, and water. Alternative 2 has the greatest number of acres proposed for commercial thinning (969 acres) followed by Alternative 4 (955 acres) and Alternative 1 (930 acres).

The action alternatives all propose to treat a small number of riparian reserve acres that are associated with harvest units. The objective of these treatments would be to enhance the development of conifer understory or to create conditions so that a conifer understory can be

established. Alternative 1 proposes the greatest amount of these treatments (64 acres) followed by Alternative 2 (38 acres) and Alternative 4 (10 acres).

Alternative 3 does not propose any of the forest health treatments. There would be a continuation of the slower growth in overstocked stands and in stands where there was a component of pines there would be a continued shift to a stand of Douglas-fir and hardwoods as the pine was suppressed from the stand. The riparian reserves proposed for treatment within the action alternatives would not be treated.

4.7 Late Successional Habitat

4.7.1 Introduction

At the landscape scale of the fifth-field watershed, none of the alternatives would have large direct adverse effects on late-successional habitat. At the subwatershed level (Map 8), however, site specific effects become more noticeable. Because these particular subwatersheds are either adjacent to the LSR or are identified as valuable for connectivity, impacts on these areas are examined here in greater detail.

4.7.2 Late Successional Habitat, Connectivity, and Fragmentation

Connectivity facilitates movement and genetic exchange among individuals of species. The NFP FSEIS discusses the assumed outcomes regarding connectivity (USDA and USDI 1994, pp 3&4-38 - 3&4-44). In the Oregon Klamath Province which contains the Kelsey Whisky FEIS analytical area, the likelihood of either very strong or strong connectivity was 66 percent. The outcome was strengthened in the NFP by the addition of Riparian Reserve Scenario 1 which increased reserves associated with intermittent streams (USDA and USDI 1994, p.3&4-242). This outcome for connectivity was an analysis of future conditions that would result over time as late-successional and riparian reserves across the landscape advanced in age. Strong connectivity was defined as less than 12 miles between large late-successional areas and a landscape of over 50 percent late successional forest (FEMAT 1993, IV-52). The NFP acknowledged that the present condition of most of the NFP planning area did not meet the definition of very strong or strong connectivity in the short term.

The ID team examined potential short-term impacts to connectivity through estimated acres of late successional habitat lost (harvest, roads, and fires) and through estimated gains (designation of an Area of Critical Environmental Concern and closed or decommissioned roads). Although there would be some effect to connectivity, as described below, given the limited scale of regeneration harvest the effects are expected to be minor. The overall acreage of treatments affecting late-successional habitat within the planning area are displayed in Table 4-9.

Alternatives 1 and 2

Regeneration harvest in Alternatives 1 and 2 would create a minor fragmentation of forested habitats and would remove a portion of spotted owl suitable habitat. Adverse impacts to wildlife, which accompany forest fragmentation and edge effects include quantitative and qualitative habitat losses, increased risk of predation, and increased competition between interior and edge species (Noss and Cooperrider 1994, Lehmkuhl and Ruggiero 1991). These impacts can be anticipated at the subwatershed level.

Alternative 1 includes a proposal to treat areas where sugar pines are dying out to maintain and enhance this species in the West Fork Whisky Creek subwatershed. This area includes portions of a connectivity block located in T33S, R8W, sec. 9. The connectivity block currently has approximately 80 percent of its habitat in a late-successional forest condition. The proposed sugar pine treatments in this area would affect cumulatively up to 273 acres.

Table 4-9. Acres of treatment affecting late-successional habitat in the Kelsey Whiskey Project Area.

	Alternative			
	1 Preferred	2	3 No-Action	4
Loss of late-successional habitat regeneration harvest (Matrix)	531	355	-----	-----
Short-term degradation of late-successional habitat by commercial thinning (Matrix)	930	*969	-----	-----
Promotion of late-successional habitat by commercial density management, and non-commercial density management (LSR)	433	434	-----	433

* Canopy closure - 60%

Due to remaining residual canopy closure and limited opportunities for this treatment, impacts would realistically be considerably less than this, and the treatment within the connectivity block would comply with the guidance in the RMP. The short term effects of reduced canopy closure would be minor. Beneficial short term effects would include accelerated late-successional habitat development. Commercial thinning which results in even spacing of trees may have short-term negative effects on spotted owl prey abundance (Waters and Zabel, 1995); fail to provide for the biotic integrity of small mammal communities (Wilson and Carey, 2000), and result in decreased abundance of amphibians (Grialou et. al., 2000).

Alternatives 1 and 3

Ongoing silvicultural treatments are the only management actions currently planned within the East Fork Whiskey Creek subwatershed at this time. Current levels of wildlife movement in and out of the area would remain unchanged until such time as harvest or fuels treatments were to occur. The potential for change remains as long as the area remains open to timber harvest. A small area has been harvested in the past, and future harvests and vegetation treatments can be anticipated within the restrictions of RMP guidelines. The potential for future fragmentation of the forest remains open as well as the future forest patch reduction between LSRs. Within the watershed, or even within the subwatershed, wildlife movement would be affected by this eventuality.

Alternatives 2 and 4

Alternative 2 would designate a 1,676 acre proposed ACEC and Alternative 4 would designate a 2,843 acre proposed ACEC in the East Fork Whiskey Creek subwatershed. While the overall area would be less for the proposed ACEC in Alternative 2, both would be located in one of the connectivity areas of concern and also in northern spotted owl critical habitat. This designation in the East Fork Whiskey Creek subwatershed could be expected to provide site specific long-term protection to late-successional habitat. It is both adjacent to LSR, and to areas identified for connectivity in the Grave Creek and Middle Cow Creek watershed analyses. The Grave Creek watershed is in checkerboard ownership patterns with private lands extensively harvested. Having a protected subwatershed immediately adjacent to it would extend the patch size of forest between two large LSRs. When, in 100 years, the Wild

Rogue Watershed has GFMA land with trees only 100 years old or less, it would provide a more robust alternative to the 100 acre owl cores that currently exist. Continued maintenance of late-successional forest in this area would be a benefit to the northern spotted owl by essentially extending the area of influence of the connectivity/diversity block in section 9. In recognition of the poor condition in the Grave Creek watershed, and the future projected age class of GFMA in the Wild Rogue watershed, revising management guidelines in the East Fork Whisky Creek subwatershed would seem prudent.

Alternative 3

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

Under Alternative 3 the connectivity blocks would not be altered and no treatments would be proposed. One implication is that this alternative would not discourage the trend for sugar pine which appears to be a gradual loss of this important conifer species in the West Fork Whisky Creek subwatershed. There would be no immediate change in levels of forest fragmentation and consequently connectivity would remain unchanged. Because commercial density management would not occur, late successional forest development in the LSR would not be accelerated beyond natural processes.

Alternative 4

As under Alternative 3, since no regeneration harvest is proposed, connectivity for northern spotted owls and forest carnivores would be maintained at the current level. There would be short term degradation of habitat through loss of canopy closure from commercial thinning treatments proposed for 570 acres in the Meadow Creek, Upper East Kelsey and West Fork Whisky subwatersheds. Although the actual extent of increased predation risk on northern spotted owls is unknown, it is expected to be minor because 40% canopy closure will be maintained.

4.7.3 Localized impacts on late-successional habitat

Under the action alternatives, adverse effects from proposed timber harvest are relatively small at the fifth-field watershed level. Effects at the seventh-field subwatershed level are more pronounced and detectable, particularly in the East Fork Kelsey Creek, Meadow Creek, and North Fork Kelsey and the north portion of the Kelsey Creek subwatersheds (see Map 8).

The effect of regeneration harvest in Alternatives 1 and 2 in East Fork Kelsey and Meadow Creek subwatersheds would be the loss of some late successional habitat but the remaining habitat would be sufficient to support the movement of late-successional affiliated wildlife. The effects of these proposed regeneration harvests on currently closed-canopy north-facing slopes would be greater than in other areas because of their strategic location in relation to this LSR, further highlighted by the Southwest Oregon LSRA (USDA/USDI 1995) which emphasizes the importance of an east-west older forest link. This connection would be affected by these proposed activities, as well as because these two subwatersheds have previously had little or no timber harvest

4.7.3.1 Upper East Kelsey area

Alternative 1

This area includes both the East Fork Kelsey Creek and the Upper Kelsey Creek subwatersheds. The East Fork Kelsey subwatershed would experience the greatest amount of disturbance to late-successional affiliates as a result of 10 timber harvest units and 308 acres of regeneration harvest (Table 4-10). This level of harvest represents approximately 9 percent of the existing mature or old-growth forest in the 3,993 acre East Fork Kelsey Creek

Table 4-10. Acres Impacted in the Upper East Kelsey subwatershed.

	Alternative			
	1 Preferred	2	3 No-Action	4
Loss of late-successional habitat regeneration harvest (Matrix)	308	217	-----	-----
Short-term degradation of late-successional habitat by commercial thinning (Matrix)	24	24	-----	24
Promotion of late-successional habitat by commercial density management, and non-commercial density management (LSR)	30	30	-----	30

subwatershed (15 percent of the subwatershed). The age class younger than thirty years would double to approximately over 600 acres. The harvested area would affect a large late successional forest patch of GFMA that currently contributes to the higher quality of habitat in the Wild Rogue watershed. However, post harvest of the subwatershed would still have more than 80 percent of the old growth forest present.

Alternative 2

Under Alternative 2 impacts would be similar to those under Alternative 1. Commercial thinning would be expected to accelerate growth of late successional forest within 20-30 years as canopy closure returns to pre-harvest level.

Alternative 3

Under the No Action alternative, RMP management goals would continue to be pursued.

Alternative 4

Under Alternative 4 there would be no regeneration harvest, and thus no late-successional forest removal. The 24 acres of commercial thinning and 30 acres of commercial density management would be expected to result in accelerated growth of the residual trees in the long term, with a short term degradation of late-successional habitat through reduced canopy closure.

4.7.3.2 Meadow Creek subwatershed

Alternative 1

Regeneration harvest may impede some movement of late-successionally affiliated species between older forest patches. This would be minimized, however, through continued ability to move through functioning riparian reserves and the remaining late successional forest. The acreage of forest under thirty years in this subwatershed would go from its current 0 percent to almost 6 percent under Alternative 1. Currently, approximately 2,212 of the 2,459 acres in the previously un-entered Meadow Creek subwatershed are in mature or old-growth forest condition. Proposed regeneration harvest actions would affect 128 acres in these forest types, or about 6 percent of the late successional habitat in this subwatershed (Table 4-11). The 27

acres of proposed commercial density management in the Meadow Creek subwatershed, which lies adjacent to the LSR, would provide benefits for late-successional habitat by promoting and accelerating development of late-successional characteristics.

Alternative 2

Impacts to movement of late-successionally affiliated species between older forest patches would be similar to those described for Alternative 1 with the amelioration of having the commercial thinning retain 60 percent canopy cover. The Meadow Creek subwatershed would be the next most affected area from regeneration harvest after Upper East Kelsey. The proposed 119 acres of regeneration harvest comprise approximately 5 percent of this subwatershed.

Alternative 3

No negative impacts would be anticipated until entries were made into the subwatershed. Although none are planned under this alternative, the opportunity still exists for further planning and impacts similar to those described for alternatives 1, 2, and 4.

Alternative 4

Alternative 4 has no regeneration harvest proposed in this subwatershed and therefore would result in no late-successional habitat removal. Commercial thinning would have impacts similar to those described for the Upper East Kelsey subwatershed.

4.7.3.3 North Fork Kelsey Creek subwatershed

Alternative 1

Impacts from commercial thinning would be similar to those described under the East Fork Kelsey subwatershed. The 14 acres of regeneration harvest may have minor impacts on habitat use and movements by northern spotted owls as a result of reduced canopy closure (Table 4-12).

Table 4-11. Acres Impacted in the Meadow Creek subwatershed.

	Alternative			
	1 Preferred	2	3 No-Action	4
Loss of late-successional habitat from regeneration harvest (Matrix)	128	119	-----	-----
Short-term degradation of late-successional habitat by commercial thinning (Matrix)	357	357	-----	357
Promotion of late-successional habitat by commercial density management and non-commercial density management (LSR)	27	27	-----	27

Table 4-12. Acres impacted in the North Fork Kelsey Creek subwatershed.

	Alternative			
	1 Preferred	2	3 No-Action	4
Loss of late-successional habitat from regeneration harvest (Matrix)	14	11	0	0
Short-term degradation of late-successional habitat by commercial thinning (Matrix)	338	* 321	0	* 321
Promotion of late-successional habitat by commercial density management and non-commercial density management (LSR)	0	0	0	0

* Canopy closure - 60%

Alternative 2

Under Alternative 2, regeneration harvest of 11 acres would occur in this subwatershed. There would be an additional 321 acres of commercial thinning. This area currently plays a role in north-south connectivity for late-successionally affiliated species. There would be short term degradation of late-successional habitat. In the long term, growth of residual trees would be expected to accelerate from the treatment, with 60 percent canopy minimizing short term impacts to species that utilize the shade for protection or microclimate control.

Alternative 3

No negative impacts would be anticipated until entries were made into the subwatershed. Although none are planned under this alternative, the opportunity still exists for further planning and impacts similar to those described for alternatives 1, 2, and 4.

Alternative 4

Under Alternative 4 no habitat removal activities are planned and the 321 acres of commercial thinning would be expected to accelerate growth of late-successional characteristics as described for Alternative 2.

4.7.3.4 West Fork Whiskey Creek subwatershed

Alternatives 1 and 2

Sugar pine treatments under the action alternatives would remove up to 1/8 acre of canopy around each sugar pine, and involve up to two trees per acre in a 1,091 acre area. Under the worst case scenario, 273 acres of habitat would be altered from a suitable to unsuitable condition by reduction in forest canopy. However, the actual results of this treatment would

likely be considerably less than 273 acres, since not all canopy within the 1/8 acre around each sugar pine would be removed; the pine itself would provide some canopy; and it is unlikely two trees per acre would be found on every acre proposed for treatment. The impacts of the treatment in Alternative 2 would have the same impacts as described in Alternative 1, with the exception that there would be no salvage incidental to this activity, which would result in more snags remaining.

Alternative 3

No negative impacts would be anticipated until entries were made into the subwatershed. Although none are planned under this alternative, the opportunity still exists for further planning and impacts similar to those described for alternatives 1, 2, and 4.

Alternative 4

The impacts from sugar pine treatments would be similar to those in described above for Alternatives 1 and 2, with the exception of acres involved. The area would involve 1,105 acres with removal of a maximum of 277 acres of suitable habitat.

4.7.4 Road Construction

For analytical purposes, all temporary road construction was assumed to have removed late-successional habitat. According to biologists of the Oregon Dept. of Fish and Wildlife, this area has one of the highest black bear densities in the state of Oregon, in part due to low road densities (Wolfer, pers. comm., 1999). Portions of the analysis area were also identified as a priority for lowering road densities to improve elk populations.

Alternative 1

Temporary road construction would reduce approximately 7 acres of late-successional habitat, and it would take approximately 60-80 years to begin to approach mature forested habitat within the road prism. With the very few acres involved, the total percent of late successional forest would not be markedly diminished. At the same time, decommissioning 9.7 miles of roads would add only a small increment towards accelerated development of late successional habitat. At the site level, there would be a small but unquantifiable reduction in disturbance to wildlife species. However, road decommissioning would have potential further-reaching negative effects through limiting access for fire response.

Alternative 2

The percentages of change in late successional habitat would be similar to those under Alternative 1, with the removal of 1.9 miles of forest through temporary road construction and 9.7 miles of road decommissioning. The impacts to 9 acres of late-successional habitat would be similar to those described for Alternative 1.

However, installation of two gates on BLM road #32-7-19.3, would limit general public access to approximately 160 acres of private in-holdings. This would have the effect of limiting disturbance from motor vehicles in the Meadow Creek subwatershed, and the southern portion of the Upper East Kelsey subwatershed. Site specific benefits to several wildlife species such as elk and bear may be realized.

Alternative 3

Routine road maintenance would continue to occur. Current low levels of recreational road use would also continue to occur, with continued relative low levels of disturbance to wildlife. The negative effects of road construction proposed under the action alternatives would not occur, and the positive effects of road decommissioning would not occur.

Alternative 4

Under Alternative 4 there would be no road construction. The effects from 13.6 miles of proposed road decommissioning are described under Alternative 1.

4.7.5 Fuels Treatments

Fire is the most important agent of disturbance in the Klamath Province (USDA/USDI 1995). The proposed underburns, mechanical fuels treatments, and slashing, hand-piling, and burning would reduce the vertical fuel ladders and overstocked conditions in upper elevations of the watershed where risk of catastrophic fire is especially high due to lightning strikes. In turn, this would reduce the risk of loss late-successional habitat and important connectivity features in West and East Fork Whiskey Creeks. The underburning proposals would reduce ground and small-diameter ladder fuels, but because these burns would occur in spring when there is high moisture content, material larger than 3-6" would not be lost, and therefore there would be minimal effects on late-successional habitat. Mechanical fuels treatments would maintain dominant and co-dominant trees, and therefore there would be only minor impacts to canopy closure through removal of intermediate and suppressed trees. The slash/pile/burning treatments would target small-diameter material, and it is therefore expected late-successional habitat would not be adversely affected. However, there would be a small risk from both underburning and slash/pile burning of escapement, and subsequent threat to the LSR. The non-commercial density management, commercial density management, pre-commercial thinning, and commercial thinning would all further assist in reducing the risk of stand-replacement fire by reduction in the number of small stems per acre, the most combustible material (Agee 1993). In addition, vegetation would quickly recover in treated areas, requiring continuous treatments over several entries for this approach to be successful in reducing catastrophic fire risk to late-successional habitat.

Alternative 1

The 1,129 acres of underburns, 289 acres of mechanical fuels treatments, and 1,847 acres of slashing, hand-piling, and burning proposed under alternative 1 would reduce the vertical fuel ladders and overstocked conditions in upper elevations of the watershed where risk of catastrophic fire is especially high due to lightning strikes, subsequently reducing the risk of loss to both late-successional habitat and important connectivity areas in West and East Fork Whiskey Creeks. The fuel treatments would have potential adverse impacts to some species with low mobility such as salamanders and invertebrates. These treatments would provide additional protection to the important connectivity subwatersheds of West and East Fork Whiskey Creeks, and would also provide limited protection in reducing downslope progression of fire into the LSR. There would be minor adverse effects to some species with low mobility such as salamanders and invertebrates as a result of brushing, piling, and removal of small diameter material.

Alternative 2

Under alternative 2, the impacts from fuels treatments would be similar to those under alternative 1. An estimated 2,542 acres of fuels treatments associated with timber harvest would be done.

Alternative 3

Under alternative 3, no fuels treatments are proposed, and the late-successional habitat would be at increased risk of loss from catastrophic fire with continued and increased fuel loading, as discussed in the fuels section.

Alternative 4

Under alternative 4, the effects of fuels treatments would be similar to those under alternative 1 except that there would be 13 greater acres of manual fuels treatments. There would be a total of 1,971 acres of fuels treatments associated with timber harvest.

4.7.6 Other Impacts

The pond enhancement projects proposed, although beneficial in general for wildlife, would not have any particular effect on late-successional forest. The approximately 221 acres of young pine conversion to Douglas-fir dominated forest in the action alternatives would have very minor effects on late-successional forest development, since this forested area is not mature. In the long term, the Douglas-fir plant association would be better suited to this area.

4.7.7 Snags and Coarse Woody Debris

The relative impacts of the various alternatives depend on the acreage affected by management actions (Appendix 2, Table 2-1). Much of the analysis area does not meet revised standards for snags and large downed wood described in the current guidance, Memorandum of Understanding (MOU) for Refining and Implementing Coarse Wood Requirements (USDA 2000). This is true for stands that have been previously logged as well as for stands that have not been logged. This assessment is based on information from the Southwest Oregon LSR Assessment (USDA/USDI 1995), information from the Cold Mule timber sale monitoring, and field observations. Snags and large downed wood are important habitat components for a wide array of species, including northern spotted owls, wood rats, martens, fishers, Del Norte salamanders, a variety of cavity-nesting birds, bats, black bears, marten and fisher (USDA 1994c). Martens failed the viability screen in the NFP (USDA/USDI 1994) primarily because matrix habitat conditions for foraging and denning were inadequate, including key marten habitat components such as coarse woody debris.

Alternative 1

Alternative 1 would affect the largest acreage with regeneration harvests and road construction. The proposed treatment around pines in the West Fork Whisky subwatershed would permit salvage logging, which would reduce potential recruitment of large downed wood. Alternative 1 would allow salvage removal of excess snags. No downed logs would be removed. However, this would limit future recruitment of large downed wood in an area where field observations show there is little to begin with. Regeneration harvests and commercial thins would further reduce this important structural characteristic for many wildlife species. The commercial thins would have a lesser impact than regeneration harvests by retaining snags, large green trees, and coarse woody debris. However, both would influence negatively the amount of large down wood that remained in the ecosystem. Although the effect would be mitigated to some degree by retaining additional green trees in regeneration harvest units, as described in the RMP and the revised standards for downed woody debris, the net remaining would still fall below standard.

Commercial density management, non-commercial density management, and pre-commercial thinning would promote greater growth on the remaining trees, which could be expected to produce larger snags and downed wood in the future. In addition, some snags would be lost due to safety considerations and some of the retained trees, snags, or large downed wood may be lost during site preparation (broadcast burning), or as a result of blow down once the stand has been opened. Fuels treatment proposals involving slash/pile/burning, underburning, mechanical fuels treatments would also remove snags and large downed wood, but the amount of loss is unknown. While the focus of these proposals is reduction in small-diameter material, there would be some minor adverse effects through incidental removal of large wood in these operations. Road construction would result in the direct removal of coarse woody debris and snags but encompasses only a small percentage of the area.

Alternative 2

Alternative 2 would have impacts similar to those in Alternative 1, but with less total acreage affected. No salvage would be included in the pine treatments in West Fork Whisky Creek, leaving a greater amount of downed wood and coarse woody debris.

Alternative 3

Alternative 3 would result in the continued development of older forests in the analysis area, with the effect of contributing additional standing and downed large wood.

Alternative 4

Impacts under Alternative 4 would be similar to those under Alternative 1, further reduced by less commercial thinning, and no regeneration harvest. Overall, more snags would and large downed wood would be left on the landscape. There would be reduction of snags and large downed wood from road construction, since none is proposed.

4.7.8 Habitat Diversity

Under Alternative 1, openings within the Wild Rogue watershed would increase since the proposed 531 acres of regeneration harvest would create greater amounts of relatively uncommon early seral conditions in the analysis area. There would be a short term increase in the amount of herbaceous vegetation for game species such as elk as an indirect effect from regeneration harvest. Habitat diversity would also be increased by the proposed 289 acres of mechanical fuels treatments, which would create additional early seral habitat. The impacts would be similar to those in alternative 2 but over fewer acres and would not occur under alternative 4, since no regeneration harvest is being proposed. Water source enhancements proposed at four sites and sugar pine treatments would add to and help maintain habitat diversity. Under Alternative 3, habitat diversity would be expected to diminish rather than increase, with the continued growth of conifers and further development of largely homogenous conifer forest, continued fading of sugar pines in the West Fork Whisky Creek subwatershed, and continued declines of meadow habitats as a result of conifer encroachment.

4.7.9 Survey and Manage Animal Species

Protocol surveys for red tree voles have been partially completed and several active nest sites have been located. Those sites would be managed in compliance with requirements as described in Chapter 2 (Section 2.3.2) as would any future sites located through ongoing and future surveys. Alternatives 1 and 2 would result in the reduction in canopy closure as a result of regeneration harvest and overstory removal treatments, which would adversely affect species associated with late-successional habitat which need higher levels of canopy closure, including red tree voles. Management recommendations for this species (USDA/USDI 2000) cite several concerns, including:

- forest fragmentation and isolation of late-successional patches which may prevent gene flow and adversely affect meta-population dynamics,
- increased geographic isolation of remaining populations could occur,
- management activities that target the removal of older trees and removal of older stand types through regeneration harvest could alter forest microclimate conditions
- management activities may create barriers to dispersal between LSRs,
- habitat fragmentation could increase potential loss of genetic variability in populations, and
- management activities may reduce forest patch size which could have adverse effects on short- and long-term survival and successful reproduction.

There would be a minor effect on red tree voles as a result of the proposed regeneration harvest. Before treatments are implemented, protection buffers would be established through

the process of climbing trees inhabited by tree voles. Great grey owls, species which utilize large meadows, may benefit from the temporary conversion of these acres to early seral habitat. Flammulated owls, a protection buffer species, are known to occur along the Rogue River (J. Sanborn, pers. comm.), and are dependent upon snags, especially pine.

The extent of the impact varies among the action alternatives with the acreage to be regeneration harvested, with alternative 1 having the greatest adverse impact and alternative 4 none as there are no regeneration harvests proposed. The proposed commercial thins, which would reduce canopy closure below 60 percent, would have a very minor, short-term (10-20 years) impact on red tree voles

There would be removal of up to 22 acres of RTV suitable habitat through temporary road construction in Alternatives 1 and 2. The indirect effects from creating a potential barrier to red tree vole movement would not be adverse, since this species has been tracked with radio telemetry crossing small forest roads (USDA/USDI 2000b). The small amount of road construction would not have a pronounced effect on great grey owls. Again, the impacts vary among the alternatives based on the extent of proposed road construction (Table 2-1, Appendix 3). There would be no loss of habitat due to road construction under Alternatives 3 and 4 at this time. The opportunity for future entries into the area leaves that possibility open for the future.

The proposed fuels treatments in the action alternatives would have the potential for adverse effects on red tree vole populations as there is the possibility of fire in the crowns of occupied trees resulting from underburning operations. There would also be risk of escaped fire resulting from human-induced activities associated with timber harvest operations increases the risk to red tree voles. Conversely, fuels treatments would reduce the risk of stand-replacement wildfire in the analysis area. Therefore, the proposed fuels treatments may have a beneficial effect on this species. Great grey owls may benefit slightly from the additional openings created by fuels treatments.

4.7.10 Summary of effects on late-successional habitat and species

Alternative 1

Alternative 1 would have the greatest degree of impacts at the subwatershed level, with 6-9 percent direct removal of late-successional habitat in the Upper East Kelsey Creek and Meadow Creek subwatersheds. These areas are adjacent to the North Fork Kelsey Creek subwatershed which previously has had substantial removal of late-successional habitat. Fuels treatments would increase short-term risk but reduce long-term hazard of catastrophic fires. However, a large portion of Upper East Kelsey Creek and Meadow Creek subwatersheds in late-successional forest remains will both support habitation and movement of late-successional species.

Alternative 2

Alternative 2 emphasizes maintenance of connectivity by maintaining a higher level of residual canopy closure, deferring some regeneration harvest units, and generally promoting connectivity into and out of the LSR through a connectivity band northward through North Fork Kelsey Creek subwatershed and westward through protection of the East Fork Whisky Creek subwatershed. There would still be substantial direct adverse effects to late-successional habitat from regeneration harvest in East Fork Kelsey and Meadow Creek subwatersheds. As in Alternative 1, this alternative would leave a large portion of East Fork Kelsey and Meadow Creek subwatersheds in late-successional forest for habitation and movement of late-successional species. Fuels treatment effects are similar to those under Alternative 1.

Alternative 3

Alternative 3, the No Action Alternative would result in a small increase in late-successional forest as additional growth occurs in the present forested stands. Roads would be routinely maintained. The risk from catastrophic fire would continue to increase with the growth of additional fuel ladders and dead and downed material. There would still exist the opportunity for future timber harvest entries which would be analyzed under a separate NEPA process.

Alternative 4

Alternative 4 is designed to focus on forest health. There would be no regeneration harvest, and therefore no direct removal of late-successional habitat. There also would be no permanent road construction, so the impacts described in Alternative 1 would not occur. Beneficial long-term fuels treatment effects would be similar to the other two action alternatives.

4.8 Unique Habitats

Ponds

The pond enhancement proposals would provide benefits for wetland-dependent wildlife through an increase in both the size of the standing water and the duration of inundation. This would enhance unique and uncommon wetlands habitats in the analysis area. There is a potential risk of impacts from invading bullfrogs and which feed on native amphibians.

Sugar Pines

The proposed sugar pine treatment in the West Fork Whiskey Creek subwatershed in the action alternatives would benefit this valuable conifer species and assure maintenance of these conifers in an area in which it appears they are substantially declining. Alternative 3 would not enhance these unique habitats, since wetlands would not be maintained or enhanced, and the remnant old-growth sugar pines would most likely continue to decline in the West Fork Whiskey Creek subwatershed.

Port-Orford Cedar (POC)

There is a chance of the spread of Port-Orford cedar root disease (*Phytophthora lateralis*) and the resultant death of cedar trees in an area near unit 35-4 from implementation of any of the action alternatives. Other harvest units are a mile or more from known POC. The spread of this disease is known to occur through water borne spores and may be transported on equipment, vehicles, and by foot. The amount of spores needed from each of these transporters to distribute infection is unknown. With five thousand board feet of timber expected from the treatment in the unit 35-4, only one or two truck loads would pass through the area. To mitigate against potential spread, equipment and vehicles would be thoroughly washed before entering the area as identified in Section 2.3.6. This is consistent with the RMP standards and guidelines in the RMP on noxious weeds management.

Log hauling from most units would likely occur along the West Fork Cow Creek Road, an area where Port-Orford cedar root disease is already present. No change in disease status would be anticipated in that location.

4.9 Threatened or Endangered Wildlife Species

4.9.1 Northern Spotted Owls

It is expected that the Federal Land allocations, standards, and guides are those necessary to achieve recovery of the northern spotted owl (USDA/USDI 1994a, p.2-73). The primary reason for listing the northern spotted owl as a threatened species involved concerns over the impact of habitat loss (issue 3) and modification resulting from timber harvest (USDA/USDI 1994b). Movement of spotted owls between large pair areas is thought to be crucial to the long-term persistence and viability of the species (USDA/USDI 1990).

4.9.1.1 Spotted Owl Suitable habitat

A home range analysis was conducted for each of the activity centers potentially affected by proposed management actions. Suitable northern spotted owl habitat was evaluated using aerial photography and Forest Operations Inventory (FOI) data to evaluate whether habitat was capable of supporting successful nesting, roosting, and foraging, including stands with trees 21" dbh or greater with 60 percent or greater canopy closure (USDI 1998). In addition, all management actions were evaluated on the ground to determine the status of suitable habitat.

Regeneration and overstory removal units would remove suitable Matrix northern spotted owl habitat but not beyond the level analyzed in the NFP. Spotted owls have been shown to avoid clearcut areas in radio-telemetry studies (Miller 1989). Activities which involved commercial thins or commercial density management were considered as degrading suitable habitat to dispersal, and would regain suitable values within about thirty years (USDA/USDI 1998). In addition to the removal of green trees within suitable spotted owl habitat, a reduction in snags, and dead and down woody material would occur with regeneration harvest. Since owls do not build nests but depend on cavities, broken-topped trees, naturally occurring platforms, and nests built by other species, direct loss of green trees as a result of regeneration harvest, and related loss of future snag recruitment, has an additional adverse effect on northern spotted owls.

The lack of fuels treatments would put northern spotted owls and their late-successional habitat at greater risk of catastrophic fire with buildup of ladder fuels, greater stems per acre, and continuous forest canopy.

Permanent road construction would have a very small irretrievable direct effect of removing suitable habitat. Temporary road construction would have a similar effect on suitable habitat of northern spotted owls through the direct removal of suitable habitat. It would be expected to return to a functional dispersal condition of 60 percent canopy closure and trees averaging 11" dbh in approximately 50-60 years. The permanent road could not be expected to return to a functional habitat condition until the roadbed was ripped and planted for rehabilitation.

Alternative 1

The acres of suitable northern spotted owl habitat expected to be removed and degraded to dispersal condition have been consulted upon with the U.S. Fish and Wildlife Service (USDA/USDI 1997 and USDA/USDI 2001). The treatments proposed under the action alternatives (Alternatives 1, 2, and 4), including timber harvest activities which remove or degrade northern spotted owl home ranges and/or northern spotted owl critical habitat are permitted under the Northwest Forest Plan (USDA/USDI 1994a; p.46). Alternative 1 would have the greatest degree of adverse effects on northern spotted owl suitable habitat, largely as a result of the 531 acres of regeneration harvest. It would, however, benefit the spotted owl suitable habitat development as a result of 9.7 miles of road decommissioning. The proposed road decommissioning would result in accelerated development of suitable owl habitat, and

reduced forest fragmentation, which would subsequently reduce the risk of predation on northern spotted owls. The level of impact varies between the alternatives based on the miles of road to be decommissioned (Table 2-1, Appendix 3). The use of chain saws, heavy machinery, and other fuel-driven equipment would increase the risk of human-induced wildfire. Also, heavy concentration of fuels generated by harvest activities that are left (i.e., lopped and scattered) may contribute to excessive fuel loading in the area and increase the likelihood of ignitions and stand-replacement fires, which would threaten suitable owl habitat. The level of impacts would be similar between the alternatives. Alternative 1 would have slightly larger impacts, but not beyond the range of impacts calculated in the NFP, while Alternative 4 would have slightly smaller impacts. Additional treatments which degrade or remove northern spotted owl habitat through placement of roads and fuel treatments which degrade or remove northern spotted owl habitat through placement of roads and fuel treatments have been consulted upon under an additional consultation (USDA/USDI 1997).

Alternative 2

Alternative 2 proposes 355 acres of regeneration harvest, which would completely remove suitable northern spotted owl habitat, an irretrievable commitment of resources but not beyond the range of impacts calculated in the NFP. In approximately 60 years the area would be expected to return to suitable habitat conditions. Commercial thinning under this alternative would maintain 60 percent canopy closure, the minimum necessary for habitat suitability for northern spotted owls, and therefore would not degrade suitable northern spotted owl habitat to a non-suitable condition. Therefore, this alternative would remove or degrade a total of 370 acres of currently suitable northern spotted owl habitat. Impacts from road decommissioning would be similar to those in Alternative 1.

Alternative 3

Under Alternative 3, the No Action Alternative, suitable conditions for owl nesting, roosting, or foraging would be maintained. East Fork Whiskey Creek drainage would remain an important area for dispersal between watersheds. Alternative 3 would result in no benefit to spotted owl habitat from road decommissioning. Impacts from machinery may also occur under the No Action Alternative, since some maintenance activities may still occur. These may include roadside brushing, plantation brushing and pre-commercial thinning and road maintenance. The action alternatives would take place in addition to the baseline that the No Action Alternative represents, so the potential impacts under Alternative 3 would be substantially lower than the other alternatives.

Alternative 4

The harvest proposed under Alternative 4 would have smaller impacts to suitable owl habitat than the other action alternatives since there would be no regeneration harvest or permanent road construction. This alternative includes approximately 955 acres of commercial thinning and commercial density management treatments. Of this total, there would be approximately 517 acres where at least 60 percent canopy closure would be retained. The remaining 306 acres of these types of treatments would reduce canopy closure below 60 percent, thereby having short-term, but only minor adverse impacts on connectivity, since canopy closure would only be reduced to about 40-50 percent and those stands would return to 60 percent canopy closure within a decade. The commercial thinning and commercial density management treatments would all serve to promote spotted owl habitat and connectivity in the long term. With 13.6 miles of road to be decommissioned, a minor benefit in development of spotted owl suitable habitat is expected.

4.9.1.2 Spotted Owl Sites

As previously described, there are 28 northern spotted owl pairs or territorial singles within the analysis area, including 13 north of the Rogue River where management actions are being proposed. Table 4-13 identifies those that occur within Matrix lands. Currently, 12 of these 13 activity centers have more than 40 percent of the area within 1.3 miles of the activity center in suitable habitat condition. No logging would occur within northern spotted owl

Table 4-13. Acres of spotted owl suitable habitat in the Matrix affected by the alternatives.

	Alternative			
	1 Preferred	2	3 No-Action	4
Suitable habitat removed - regeneration harvest	531	355	----	----
Suitable habitat removed – permanent road construction	----	----	----	----
Suitable habitat removed – temporary road construction	10	13	----	16
Suitable habitat removed – West Whisky pine treatment	273	273	----	273
Total suitable habitat removed	814	644	----	289
Suitable habitat degraded to dispersal habitat – commercial thinning	930		----	853
Total suitable owl habitat loss	1,744	1,341	----	1,142

activity centers. Adequate habitat is expected to be present to maintain survival and reproductive capabilities for the short term. The proposed fuel treatments would provide additional protection for northern spotted owl activity centers by reducing tree density, ladder fuels, and generally decreasing the risk of stand-replacement fires.

Table 4-14 summarizes the impacts of the alternatives on the spotted owl sites within 1.3 miles of the proposed actions. They would all continue to be considered viable sites following proposed harvest activities. All of the spotted owl activity centers affected by proposed activities under each alternative would retain more than 40 percent suitable habitat within their 1.3 miles of home range.

Alternative 1

It is uncertain what the effects to the reproductive success of the Kelsey's Demise pair from habitat removal. Reproductive success may or may not be impaired. The Kelsey's Demise pair is located within Matrix land. A long term viability activity center (#2069) would have a 18 percent reduction in suitable habitat from timber harvest. Potential adverse direct effects on the reproductive success of the Kelsey's Demise pair may result from habitat removal. The proposed road construction in T33S, R9W, section 1, located adjacent to the 100-acre core area, would occur within 1/4 mile of the activity center. There may be further indirect effects from future harvest and recreational activities enabled by the existence of the road. The road construction, itself, would occur outside of the nesting season, which would minimize direct effects to the pair.

Table 4-14. Effects on spotted owl sites within their home range and adjacent to core areas.

Acres of Suitable Habitat within 1.3 miles of Activity Center (Home Range)					
	Pre-harvest Suitable	Suitable Removed	Degraded to Dispersal	Post-harvest Suitable Remaining	Acres of suitable habitat removed adjacent to 100-acre core area
Kelsey's Demise #2069 (Matrix)					
Alt 1	2,205	306	80	1,819	26
Alt 2	2,205	231	0	1,974	0
Alt 3	2,205	0	0	2,205	0
Alt 4	2,205	0	80	2,125	0
KCNA #3280 (Matrix)					
Alt 1	1,882	113	202	1,567	27
Alt 2	1,882	34	237	1,611	0
Alt 3	1,882	0	0	1,882	0
Alt 4	1,882	0	84	1,798	0
Whisky Creek #2013 (LSR)					
Alt 1	2,350	0	0	2,350	0
Alt 2	2,350	0	0	2,350	0
Alt 3	2,350	0	0	2,350	0
Alt 4	2,350	0	0	2,350	0
Small Shot #2014 (LSR)					
Alt 1	2,679	0	33	2,646	0
Alt 2	2,679	0	33	2,646	0
Alt 3	2,679	0	0	2,679	0
Alt 4	2,679	0	33	2,646	0
One 4 All #2619 (Matrix)					
Alt 1	2,619	68	0	2,551	0
Alt 2	2,619	68	0	2,551	0
Alt 3	2,619	0	0	2,619	0
Alt 4	2,619	68	0	2,551	0
Cool Springs #3282 (Matrix)					
Alt 1	2,746	54	268	2,424	0
Alt 2	2,746	18	140	2,588	0
Alt 3	2,746	0	0	2,746	0
Alt 4	2,746	0	275	2,471	0
Taylor Gulch #0881 (LSR)					
Alt 1	1,027	0	0	1,027	0
Alt 2	1,027	0	0	1,027	0
Alt 3	1,027	0	0	1,027	0
Alt 4	1,027	0	0	1,027	0

It is uncertain what effect on reproductive success the regeneration harvest in suitable habitat would have. The KCNA activity center (#3280) is expected to lose a total of 315 acres or 17 percent of its suitable habitat. This is derived from impacts resulting from 113 acres of regeneration harvest and 202 acres of degradation to dispersal habitat condition.

The Cool Springs activity center (#3282) is expected to lose 54 acres of suitable habitat representing 2 percent of its existing suitable habitat. Degradation of an additional 268 acres is expected within this home range including the proposed sugar pine treatments in the West Fork Whisky Creek subwatershed. It is unclear what the effects, if any, on habitat suitability would result from these proposed small openings. If the two openings per acre had the effect of reducing the suitability on that 1/4 acre, approximately 140 acres of suitable habitat would be removed. Therefore, the post-treatment amount of suitable habitat for this pair's home range would be 2,424 acres, representing a reduction of 12 percent.

A 50 acre regeneration harvest unit (Unit #1-2) would be located adjacent to Late-successional Reserve and about 0.5 miles west of the Kelsey's Demise owl site. Another regeneration harvest unit (Unit #6-5) of 26 acres would be adjacent to this same owl activity center on the southeast. These two units, in combination with 161 acres of other regeneration harvest within the same section, would remove LSH. However, there is still sufficient late successional forest for habitation and movement by late successional affiliated species. Although there will be 54 acres of proposed regeneration harvest treatments in the vicinity of the Cool Springs activity center the effect would be negligible relative to the ability of northern spotted owls to disperse from the Galice/Fish Hook LSR east and northeast across the Grave Creek watershed to the nearest LSR to the east, the Galesville/South Umpqua LSR.

Alternative 2

Because there is considerably less regeneration harvest in Alternative 2 compared to Alternative 1, direct effects of habitat removal are lower. Degradation of currently suitable habitat to dispersal condition is comparable between Alternatives 1 and 2. The KCNA owl pair would lose 14 percent of its suitable habitat within its home range, resulting from 34 acres of regeneration harvest and 237 acres degraded to dispersal habitat conditions. The 231 acres of habitat proposed for removal under Alternative 2 would result in a 10 percent loss of suitable habitat in the Kelsey's Demise home range. The Cool Springs activity center would lose 18 acres of suitable habitat and have degradation of 140 acres to an unsuitable condition with impacts similar to those under Alternative 1. The remaining 2,588 acres of suitable habitat represent a 6 percent reduction in suitable habitat in the activity center.

Alternative 2 would benefit owl dispersal through the additional habitat protection provided by the proposed ACEC in the northeast portion of the planning area.

Alternative 3

Over time there would be an increased risk of wildfire through increase in stand density, increase in ladder fuels, and no planned fuels treatments in areas known to be high hazard. As fires might occur in unpredictable locations, spotted owl sites would be as much at risk as other resources.

Alternative 4

As there is no regeneration harvest proposed for Alternative 4, there would be no direct effects from habitat removal. Conversion of suitable habitat to a dispersal condition would be comparable to Alternative 2. Cool Springs activity center would have a 10 percent loss with 275 acres degraded from suitable condition to dispersal habitat. In Kelsey's Demise activity center, 80 acres would be degraded from a currently suitable condition to dispersal habitat, representing a loss of 4 percent. The KCNA activity center would have 4 percent or 84 acres degraded from suitable condition to dispersal habitat.

Alternative 4 would provide greater benefits for spotted owls than Alternative 3 (the No Action Alternative) due to increased habitat protection that would be provided by the

proposed ACEC and forest health treatments designed to accelerate growth of late-successional habitat conditions which would also encourage dispersal.

4.9.1.3 Spotted Owl Critical Habitat

The area immediately east of the LSR includes a large block of northern spotted owl critical habitat. Critical habitat for the northern spotted owl was identified on January 15, 1992 (57 FR 1796) for specific areas which provide the primary needs (constituent elements) essential for the conservation of the species. These needs include essential nesting, roosting, and foraging habitat (USDI 1994). The actions which are proposed in this alternative may affect northern spotted owl critical habitat through habitat removal, habitat degradation, and actions which appreciably slow the development of spotted owl habitat. While regeneration harvest, overstory removal, and commercial thins all have these effects on critical habitat, the greatest adverse effects occur through habitat removal resulting from regeneration harvest and overstory removal. The Biological Opinion for NFP concluded that the amount of harvest expected in the Matrix would not be severe enough to alter the functions originally intended for critical habitat.

There are two Spotted Owl Critical Habitat Units (CHU) located in the planning area: #OR-65 and #OR-67. Both CHUs would be affected by the proposed alternatives. The impacts to #OR-67 would be minimal, since only 18 acres would be commercially thinned under Alternatives 1, 2 and 4. Impacts to CHU #OR-65 would be greater, as shown in Table 4-15. This CHU was designated to provide inter-provincial links between the Klamath Mountains Province and the Cascades Province, and between the Klamath Mountains Province and the Coast Province.

Alternative 1

Under Alternative 1, approximately 451 acres of regeneration and overstory removal harvest would occur within OR-65. In addition, the removal of approximately 175 acres of habitat adjacent to sugar pines in the West Fork Whiskey Creek subwatershed would occur. Additional adverse effects are expected by the proposed 850 acres of commercial thinning in OR-65, which would degrade critical habitat to less than the 60 percent canopy closure considered to be necessary for nesting, roosting, or foraging by northern spotted owls in portions of these units. With respect to habitat degradation from thinning treatments, it is not possible, given the variability both on the landscape and in the prescriptions, which are combinations of

Table 4-15. Acres of spotted owl Critical Habitat in CHU #OR-65 affected by the alternatives.

Actions in Critical Habitat	Alternative			
	1	2	3 No Action	4
Regeneration harvests	451	324	0	0
W. Fk. Whiskey Cr. Pine Treatment	175	175	0	175
Permanent road construction	0	0	0	0
Temporary road construction	10	13	0	0
Total Critical Habitat removed	626	610	0	273
Total Critical Habitat degraded- Commercial Thinning	850	649	0	436
Total Acres of Critical Habitat Impacted	1,727	1,259	0	709

commercial thins and pre-commercial thins, and commercial density management and non-commercial density management, to determine the precise amount of habitat which would be degraded below the 60 percent canopy closure suitability threshold. For the purposes of analysis, a worst case scenario has been assumed in which all 850 acres are degraded below suitable condition, but the expected result would most likely be at least one-half of the acres involved would still be in a suitable condition post-harvest.

The 451 acres of proposed regeneration harvest treatments, 175 acres of habitat removed around sugar pines in the West Fork Whisky Creek subwatershed, 18 acres removed by road construction and 850 acres of proposed commercial/non-commercial thinning in OR-65 would result in a lowered quality and quantity of suitable habitat. Under the worst case scenario of Alternative 1, the treatments in CHU#OR-65 would affect approximately 1,727 acres or about 2 percent, of the 74,664 acres within this CHU. In CHU#OR-67 approximately 18 acres out of the 98,238 acres within this CHU would be affected.

Alternative 2

Project activities would affect 1,259 acres, less than 2 percent of the total CHU acreage. Under alternative 2 the 324 acres of regeneration harvest, 175 acres of habitat removed around sugar pines in the West Fork Whisky Creek subwatershed, 13 acres removed by road construction and 649 acres of commercial thins in CHU#OR-65 are expected to lower the quality and quantity of suitable habitat. Fuels treatments would reduce the risk of stand-replacement wildfire in northern spotted owl critical habitat

Alternative 3

Over time there would be an increased risk of wildfire through increase in stand density, increase in ladder fuels, and no planned fuels treatments in areas known to be high hazard. As fires might occur in unpredictable locations, spotted owl sites would be as much at risk as other resources.

Alternative 4

Proposed treatments around sugar pines and from commercial thins over a total of 709 acres would affect less than 1 percent of the CHU acreage. It would not be severe enough to constitute adverse modification because the function of critical habitat would not be appreciably reduced for the survival and recovery of the species. The 12 - 17 acres of proposed commercial/non-commercial thinning treatments in the action alternatives in OR-67 would have very minor effects on the function of this critical habitat unit. Fuels treatments would reduce the risk of stand-replacement wildfire in northern spotted owl critical habitat.

Road decommissioning in northern spotted owl critical habitat would add to the development of late-successional forest, and reduce the risk of predation.

4.9.2 Marbled Murrelets

4.9.2.1 Marbled Murrelet Suitable Habitat

Suitable habitat for marbled murrelets includes old growth and mature coniferous forest up to 50 miles from the coast with marbled murrelet critical habitat identified within 35 miles from the coast (USDI 1996). Over 600 surveys have been conducted in the Glendale Resource Area with no detections of murrelets (USDI 2000). The nearest known sighting of a marbled murrelet is approximately one and one-half miles north of the northwest boundary of the watershed in the Coquille River watershed in the Siskiyou National Forest. Surveys would be conducted prior to sale and identified nest sites would be protected (see 2.3.2 Marbled Murrelet). Thus, it is likely that the proposed harvest of 69 acres of suitable murrelet habitat within 35 miles of the coast would have minor effects, if any.

Alternative 1

Alternative 1 would have negligible effects on suitable marbled murrelet habitat through direct removal of 531 acres of suitable habitat and degradation of 692 acres of commercial thinning. Treatments under this alternative, including regeneration and overstory removal units 28-A, 33-1, 33-2, 33-A, and 4-1 would comprise 69 acres of suitable habitat which would be removed within the General Forest Management Area (GFMA) within 35 miles of the coast. PDFs would ensure protection of murrelet nesting sites.

Road decommissioning in marbled murrelet habitat within 35 miles of the coast under the action alternatives would benefit marbled murrelets in the long-term by accelerating the growth of late-successional forest and reducing the amount of edge habitat which both fragments the forest and provides additional opportunities for murrelet predators (USDI 1997).

The fuel treatments proposed under the Action Alternatives would reduce density levels, decrease ladder fuels, and generally serve to reduce the risk of stand replacement fires in suitable marbled murrelet habitat.

Alternative 2

Alternative 2 proposes 10 acres of regeneration harvest within 35 miles of the coast and would adversely affect this small amount of suitable marbled murrelet habitat. Impacts to Units #12-2, and #35-4 would be similar to those described in Alternative 1. The 355 acres of regeneration harvest and 697 acres of commercial thins would occur within the suitable habitat range up to 50 miles from the coast, thus reducing the quality and quantity of suitable habitat. Road decommissioning and fuels treatment effects would be similar to those in Alternative 1.

Alternative 3

Alternative 3, the No Action Alternative, would result in some minor beneficial effects in maintaining and not increasing the current level of forest fragmentation. The lack of fuels treatments however would put marbled murrelets and their late-successional habitat at greater risk of catastrophic fire with buildup of ladder fuels, greater stems per acre, and continuous forest canopy.

Alternative 4

The 853 acres of commercial thins would occur within the suitable habitat range up to 50 miles from the coast, of the marbled murrelet, thus reducing the quality and quantity of suitable habitat. Road decommissioning and fuels treatment effects would be similar to those in Alternative 1.

4.9.2.2 Marbled Murrelet Critical Habitat

The action alternatives would not remove or degrade any marbled murrelet critical habitat. Unit # 35-4 is the only proposed commercial unit within critical habitat, and the prescription for thinning in these units specifies retention of 60 percent canopy closure.

The proposed fuels treatments in the action alternatives would reduce the risk of catastrophic wildfire throughout the analysis area, and thereby provide increased protection for critical habitat. There are a total of 284 acres of proposed underburns, and 175 acres of slashing, hand-piling, and burning proposed within marbled murrelet critical habitat. It is expected these treatments will reduce the risk of stand-replacement wildfire, and therefore reduce risk of large-scale loss of suitable murrelet critical habitat, by reducing vertical fuel ladders, overstocking, and brush.

The approximately 10-14 miles of road decommissioning in marbled murrelet critical habitat would benefit marbled murrelets in the long-term by accelerating the growth of late-successional forest in marbled murrelet critical habitat.

It is important to reemphasize that while the effects analysis presented here was performed by examining effects to suitable habitat, over 600 surveys in the vicinity of the project area (USDI 2000) have resulted in no detections of murrelets. Therefore, the analysis is a “worst case scenario”, and actual impacts to the recovery of marbled murrelet critical habitat would be very small with any of the alternatives.

4.9.3 Bald Eagles

The three action alternatives would limit activities near the active bald eagle nest site in the vicinity of Alder Creek, consistent with RMP guidelines (USDI 1995), which include retaining at least 50 percent forest canopy closure, and large trees and snags in units within mile of the nest, which would affect units #27-1A, 27-1B, and 28-1B. By meeting these guidelines, none of the alternatives would have adverse effects on bald eagles.

4.9.4 Fisheries

The planning area supports a number of fish species, including steelhead and cutthroat trout and Southern Oregon/Northern California coho salmon, an ESA threatened fish species. Because all proposals are consistent with the Aquatic Conservation Strategy (ACS), they would prevent or minimize any adverse effects on aquatic species, their habitat, and to water quality. Fisheries streams that are adjacent to proposed harvest units (unit 16-1 on West Fork of Whisky Creek and unit 1-2 on East Fork Kelsey Creek) have two tree length buffers. Other intermittent and perennial streams adjacent to proposed units are buffered by a distance of one site potential tree height. Properly designed riparian reserves would maintain current stream and riparian condition.

Road renovation, decommissioning, out-sloping and water-dipping could result in sediment entering streams and resultant localized increases in turbidity during the first major rainstorm of the wet season. Of these treatments, decommissioning has the greatest potential for contributing sediment to streams, especially when culverts in stream channels are removed. Road decommissioning in the Whisky Creek and Kelsey Creek watersheds is from 0.5 miles to 2 miles, respectively, from coho and steelhead habitat (see Table 3-4 Streams and estimated distance of fish presence). Adverse effects of stream sedimentation on aquatic organisms would be the most severe immediately downstream of each crossing but they would rapidly diminish with increasing distance from the road. Use of appropriate project design features (Chapter 2) would help ensure that any adverse effects on aquatic habitat near the disturbance are negligible. There would be no significant short or long term adverse effects on habitat used by any state or federal special status, sensitive, threatened, or endangered fish species in the EIS area streams, including the Wild and Scenic Rogue River. Since temporary road locations are on or near ridgetops on stable ground and are not near streams, road construction would not degrade water quality and stream habitat. No permanent road construction is planned under any alternative. Road treatments other than construction would reduce potential for erosion or failure of the road prism and resultant stream sedimentation in the long term. Closing roads using barricades and gates would eliminate vehicle use and erosion of unsurfaced roads during the winter.

Only very limited vegetation treatments are proposed in any of the riparian reserves; no commercial products would be removed. Vegetation and fuels treatments in selected riparian reserves (Appendix 2) would reduce potential for severe wildfire and would also accelerate development of late successional characteristics in the long term. Implementing appropriate project design features (Chapter 2) in these sensitive areas would minimize any adverse short term effects. Rain-on-snow events on these timber harvest units is not expected to increase water yield and peak flows because units are spread across several subwatersheds and the percentage of the transient snow zone that would be open following harvest is considered

within the acceptable range (Wild Rogue Watershed Analysis). Base flows would not decrease because none of the alternatives would encourage growth of riparian hardwoods.

The project would not hinder or prevent attainment of ACS objectives at the 5th field watershed scale in the long term (Appendix 11). The proposed actions would maintain all factors in the National Marine Fisheries (NMFS) Matrix of Pathway Indicators at the project and watershed scales. It also meets terms and conditions of the NMFS LRMP/RMP Biological Opinion of March 18, 1997. When the effects of the proposed actions in each of the alternatives are added to the environmental baseline and cumulative effects elsewhere in this 5th field watershed, the likelihood of resulting adverse effects on or incidental “take” of southern Oregon/northern California coho salmon or its critical habitat is negligible. Nor would there be any adverse effects to Essential Fish Habitat (Magnuson-Stevens Act) for coho and chinook salmon.

4.10 Roads/Transportation System

None of the proposed action alternatives would greatly affect the transportation system. The temporary roads represent short spurs to reach landings and would not be part of the long-term transportation system.

Similarly, the proposed road decommissioning and closures through gates and barricades would have only minimal effects on the transportation system, since most roads to be closed are short, dead-end spurs. The largest impact to the transportation system would come from the proposed gates and barricades on the Dutch Henry road system (road #32-7-19.3). This system of closures would remove public vehicle access to approximately 6.9 to 9.2 miles of roads.

The action alternatives would incorporate past-due (deferred) road maintenance work. Examples of those maintenance items includes culvert cleaning, culvert replacement, road surface conditioning, surface replacement and roadside brushing. Closures would reduce rutting and scouring of natural surfaced roads, and reduce impacts caused by human presence. Some activities such as hunting, recreation, rock hounding, casual touring, and mushroom hunting would be slightly affected.

Under Alternatives 1, 2, and 4 there would be a net decrease in miles of permanent roads throughout the Kelsey Whiskey Planning Area. Approximately 9.7 miles of existing roads would be decommissioned. New gates and road barriers would also be constructed to close off an additional 7.6 miles of roads to public motor vehicle use. Approximately 1.9 miles of new road construction would take place to facilitate timber harvest and fuels mitigation treatments but these roads would be temporary in nature and would be decommissioned upon the completion of fuels treatments. Although there would be no new permanent road construction under any of the alternatives, the improvement of existing roads and temporary road construction would provide improved access for fuels treatments across more acres.

Alternative 3, the No Action Alternative, road maintenance may continue to be deferred and would have a negative effect on the transportation system within the EIS area. Local spur roads would continue to degrade from lack of adequate road maintenance. Improvement of drainage patterns on improperly designed subgrades would not be accomplished. Diminishing surface rock and rusting culverts would not be replaced. Roads would become overgrown with vegetation, eventually preventing access for checking current and deferred road maintenance needs and impairing fire suppression efforts. Drainage designs on local roads would become impaired by movement of slough and road embankment material.

4.11 Undeveloped Areas

Currently undeveloped areas would receive negligible impacts from the actions proposed under Alternative 1 with improvement of jeep roads in the project area. Units 1-1 and 6-4

would occur in undeveloped areas. The impacts would be minimal and would consist of slight increases in ambient sound levels (road traffic, land treatment actions) which slightly increases cultural influence on lands generally unaffected by man. These impacts are minor and would be difficult to accurately detect. This is true, also, for the 1979-1980 inventory unit 11-16 (Zane Grey). See section 1.1.5 and Table 5-1 for more discussion on this wilderness inventory unit.

None of the alternatives foreclose any management options considered reasonable for the stewardship of undeveloped parcels. The integrity of these lands, from the perspective of the appreciation of undeveloped ecosystems, would remain largely intact.

4.12 Social Environment

This section represents numerous aspects of the human social environment, with regard to use of or impact from use of public lands.

4.12.1 Rural Interface

Private parcels within the planning area range in size from about 20 to more than 300 acres. Most of these are clustered near Marial, west of Kelsey Creek. Exceptions are mining claims in the Whisky Creek drainage, Black Bar Lodge and two parcels in the Meadow Creek Drainage. Many of the private parcels within the planning area are actively managed for timber or mineral extraction with entries occurring within the last 5 years.

Major issues related to rural interface management within the planning area would likely be those identified in the RMP as creating the greatest impact on interface areas, including: fire and fuels management and related effects such as smoke, visual resource management and protection of views from within residences in the area, short- and possibly long-term increased noise levels, and dust and other problems associated with increased vehicular traffic.

Recreational use, timber harvest, Special Forest Products, vegetative treatments, and road construction/decommissioning actions will continue to provide employment and income at levels comparable to recent years. Underlying regional and national economic and population trends will be the primary determinants of regional employment, income, population, and poverty.

Payments in Lieu of Taxes and payments under the Secure Rural Schools and Community Self-determination Act of 2000 (P.L. 106-393) would be unaffected by any of the proposals.

As a result of the effects analysis throughout this document, it appears that there would be no economic effects from any of the proposals that would be different from those analyzed in the RMP/EIS.

4.12.2 Recreation

All alternatives would present little or no impact on existing recreation uses within the area. Road decommissioning actions and cessation of road maintenance on selected routes would slightly diminish motorized recreational access. Sixteen to twenty-two miles of road would be closed to motorized use, representing 7-12 percent of the roads in the project area, the northern part of the watershed. The actual number of visitor reductions is unknown as the road decommission projects are in very remote locations. This reduction in access is minimal. Harvested areas would be visible to recreationists who enter the area. However, recreation use in the planning area is focused and concentrated within the boundaries of the Rogue National Wild and Scenic River. Recreational activities occurring within the river corridor

would be minimally affected by any of the alternatives, if at all. Neither the Grave Creek to Marial or Galice-Hellgate National Back County Byways would be adversely affected by any of the alternatives. Dispersed recreation activities which occur along the other existing roads and those activities in unroaded areas within the planning area would not be affected by any of the alternatives. Those areas would continue to remain open to the same type of use it currently experiences.

4.13 Visual

None of the alternatives would affect the available scenic resource as viewed from the Rogue National Wild and Scenic River corridor. Areas viewed from locations along roads or other access points would not be adversely affected and would meet appropriate VRM objectives for those lands (Map 14). Key observation points for the planning area are within the Congressionally designated boundaries of the Rogue National Wild and scenic River. These are specifically located on various portions of the river surface and the Rogue River National Recreation trail. Available views of the planning area from these observation points are predominantly in the foreground to near middle ground zone (0 - 2 mi.). These zones fall within existing Visual Resource Management (VRM) Class II designations as described in the RMP. This classification provides for retention of the existing character of the landscape and the implementation of project design features that do not attract the attention of the casual observer viewing from key observation points.

4.14 Population and Economics

There would be very little change in the net Matrix lands available for commercial timber management (Table 4-4). The proposed timber harvest and other vegetation treatments fully comply with the RMP direction. Commercial harvest would continue in the future in accordance with the standards and guidelines in the RMP and the Northwest Forest Plan. Special Forest Products are not a major economic resource in this area because of the remote nature of the Planning area. And the vegetation treatments and road proposals would not alter accessibility or productivity of any Special Forest Product. As a result, there would be no economic impacts different from those already analyzed in the RMP/EIS associated with timber harvest or other vegetation treatments.

Similarly, there would be no substantial economic effects of the land use allocation changes. Recreation would not be hindered or encouraged by the designation of a proposed ACEC. The road proposals would also not increase or reduce visitation since the construction and decommissioning would all involve short, dead end spurs. Paving some of the major roads may make driving them safer, but this area is a very remote and isolated area and it does not appear that this minor improvement in short stretches of some of the arterial roads would result in increase use.

As a result of the effects analysis throughout this document, it appears that there would be no economic effect from any of the proposals that would be different from those analyzed in the RMP/EIS.

4.15 Minority and Low Income Populations (Environmental Justice)

Environmental justice is a movement promoting the fair treatment of people of all races, income, and culture with respect to the development, implementation, and enforcement of environmental laws, regulations and policies. The Glendale Resource Area recognizes the concerns for environmental effects, including human health, economic and social effects, of

its actions, including their effects on minority communities and low-income communities, as required by the National Environmental Policy Act (NEPA). There are no minority communities or low income communities within or nearby the Kelsey Whisky PA.

4.16 Cultural

Alternative 1, 2, 4

The potential for ground disturbance resulting from timber management activities would increase under all the action alternatives. Alternative 1 has a somewhat higher potential for site disturbance resulting from higher impact harvest techniques. Under Alternative 1 and Alternative 4 archaeological site #35HS11-18 would receive adequate protection under the proposed management recommendations outlined and followed in section 2.3.8. Under Alternative 2, the archaeological site could possibly be in danger of destruction due to ground disturbing activities of the proposed timber harvest. This site would be in danger even following the management guidelines. Recommendations under section 2.3.8 would be followed.

The possibility of pot hunting and illegal relic collecting at archaeological sites would increase through increased access and visibility of archaeological sites. Looting could impact not only the site, itself, but render it impossible to tell the story of the site. This could happen equally under each of the action alternatives.

The impacts from escaped fire would be potentially the same for all action alternatives. Fire behavior of a prescribed burn can vary throughout the landscape, and therefore, the possible impacts on the cultural resource site could be different, depending on where the site is located. Landscape conditions after commercial harvest would help to determine the exact fuels treatment, but at a minimum the mitigating measures identified in section 2.3.8 would be followed. These measures would minimize potential impacts of fire equally among the action alternatives.

The effects of fire on historical and prehistoric archaeological sites would be minimal. Under all fire prescriptions the goal is to protect the cultural resource site. However, due to the nature of fire and possible changing conditions during a burn, a burn could escape the intent of the prescription. If this were to happen, historic sites and artifacts could possibly be harmed or destroyed.

Alternative 3

The No Action alternative would maintain the current level of cultural site protection from potential disturbance from timber management activity. Under the No Action Alternative archaeological site #35HS11-18 would remain unchanged and intact. Risks to some historical site components would increase over time if fuel loads from around specific sites or even the general landscape are not reduced. The fires in southern Oregon during 2002 were extensive and represent the potential for any of the high fuel load sites within the Wild Rogue Watershed.

4.17 Native American Religious Concerns

There are no areas within the Kelsey-Whisky EIS Planning area that are known to be currently important as Native American religious sites or are in use for traditional purposes at this time.

4.18 Areas of Critical Environmental Concern and Wild and Scenic Rivers

Areas of Critical Environmental Concern

There are currently no Areas of Critical Environmental Concern (ACEC) or Research Natural Areas (RNA) in the planning area. The Bobby Creek ACEC/RNA is adjacent to the planning area, on the north boundary. It is in a different watershed and would not be affected by any of the proposed alternatives.

Alternatives 2 and 4 include proposals for designating an ACEC in the East Fork Whisky Creek subwatershed. The proposed management plan (Appendix 10) includes details of the area and the proposed management direction. Designation of an proposed ACEC would mean that impacts to it would be assessed with future projects, as ACECs are a critical element under NEPA.

Under Alternative 3, the No Action Alternative, scheduled timber harvest would continue in and around the area as planned for in the Medford District Resource Management Plan. Should regeneration harvest ever occur along the border of the proposed ACEC, windthrow to border trees, temperature increases, and light increases could be anticipated with the potential to disrupt the localized ecological processes as described in Chapter 3. Road construction for bordering timber activities would create further access to the area along with the potential to introduce non-native vegetation, including noxious weeds.

Wild and Scenic Rivers

The Rogue River is the only river currently designated under the Wild and Scenic Rivers Act of 1968. None of the alternatives would affect the Outstandingly Remarkable Values (ORV's) which led to the Rogue's inclusion within the Wild and Scenic Rivers System. All proposed treatments would conform to the VRM standards and other restrictions called for in managing Wild and Scenic Rivers. Unit 2-3 has the potential for creating a noise impact to users on the river. The mitigation added to activity occur from November through April, impacts to recreationists would be to reduce or eliminate impacts. See section 3.4 Water Quality, for further discussion.

The RMP recognizes four creeks (Big Windy, East Fork Windy, Dulog and Howard) as suitable for potential designation as Wild and Scenic "Rivers." They are all located on the lands south of the Rogue River corridor and are presently under interim management guidelines that protect and preserve their inherent resource values. There are no proposals on the south side of the Rogue River, so there would be no effect on the streams found to be suitable for Wild and Scenic River status there.

4.19 Wilderness

Alternative 1, 2, and 4

The existing Wild Rogue Wilderness would remain unaffected by any of the action alternatives. There are no planned high standard roads, recreation facilities, or any other developments adjacent to the wilderness. Fuels treatments are planned near the wilderness and are consistent with the management plans of both the Medford District and the Siskiyou National Forest. There would be no impacts anticipated to the outstanding values of the Wild Rogue Wilderness, or to the recreation user's experience while in the wilderness.

Alternative 3

Planned fuels treatments would not occur as described in the Kelsey Whisky EIS. The risk of catastrophic fire occurring and entering the wilderness would remain high. Fire is considered a natural part of the environment and as such, would not necessarily be considered negative. However, the magnitude of the fire could not be predicted, as was seen by the nearby Biscuit fire in the summer of 2002. Loss of wilderness values, in the event of a catastrophic fire, are not quantifiable, but the assumption can be made that the current level of visitor use would diminish significantly over the short term. However, over the long term, as natural vegetation reasserted itself, visitor use could be expected to again increase.

4.20 Air Quality

The Clean Air Act requires each state to develop and implement a State Implementation Plan (SIP) to ensure that National Ambient Air Quality Standards are attained and maintained for particulate matter (PM₁₀). Within the implementation plan developed for Oregon, a goal to reduce particulate matter emissions (PM₁₀) by 50 percent by the year 2000 was established. PM₁₀ was also identified by the State Implementation Plan as the basis for non-attainment within the Grants Pass and Ashland/Medford area.

The planning area is approximately 30 miles from the Grants Pass non-attainment area and over 50 miles from the Medford/Ashland non-attainment area. Due to the distance involved, it is expected that prescribed fire operations will have little to no effect on these non-attainment areas.

The planning area is adjacent to only a small number of smoke sensitive areas. Since the Kalmiopsis and Rogue Wilderness areas are south and directly west, respectively, of the planning area, the prevailing winds would prevent smoke intrusions. Intrusions into the Ranch, river corridor, Rand and Galice may occur if nighttime inversions cause smoke drainage into these areas. Due to the combination of the prevailing winds and the complex terrain, intrusions into the Cow Creek drainage are not likely.

One way to prevent smoke intrusions is to space burn units out so that they are treated at different times of the year. Broadcast and underburning would generally occur in the spring. Pile burning would occur in the winter and would not produce enough smoke to cause intrusions into any smoke sensitive area.

An analysis of PM-10 and PM-2.5 emissions from fuels treatments throughout the planning area by prescribed fire treatment type was performed using the CONSUME fire behavior modeling computer software package. CONSUME (version 2.1) was developed by the Fire and Environmental Research Applications team, USDA Forest Service, Pacific Northwest Research Station. Fuel loadings, expressed in tons per acres, were entered into CONSUME as were weather and fuel moisture conditions typical of the season in which the various types of burning would occur. Based on these inputs, CONSUME calculates particulate emissions. Computer simulations were completed for each type of prescribed fire activity using appropriate fuel loadings and burn conditions. The predicted emissions were multiplied by the amount of acres proposed for each alternative to arrive at a total predicted emissions (measured in tons).

Table 4-1 displays the expected tons of emissions amount of particulate matter (size categories PM-10 and PM-2.5) produced from burning under the alternatives. PM-10 is the current national ambient air quality standard against which prescribed fire activities are measured. PM-2.5 emission standards are new and provide a more restrictive air quality standard. Both PM-10 and PM-2.5 emissions have been modeled although PM-10 emissions will be the numbers referred to for this analysis. Of the action alternatives, Alternative 4 would produce the least amount of PM-10 emissions while Alternative 1 would produce the most.

It's important to note, however, that the emissions shown in Table 4-1 are totaled for all the acres in all the stands proposed to be treated. Treatments, in actuality, would not occur at the

same time and place, but over a period of several years, with several burn days in any one year. In addition, the exact locations of the burning would be dispersed throughout the planning area which would also reduce potential for concentrated local impacts. The net result is that the emissions over any one period of time would be considerably less than those shown in Table 4-1. The figures do, however, represent a valid estimate of the cumulative emissions to be produced under the proposals.

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

Prescribed burning emissions, under all alternatives, is not expected to adversely effect annual PM10 attainment within the Grants Pass and Medford/Ashland non-attainment areas. Any smoke intrusions into these areas from prescribed burning are anticipated to be light and of short duration.

Prescribed burning would be scheduled primarily during the period starting in January and ending in June. This treatment period minimizes the amount of smoke emissions by burning when duff and dead woody fuel have the highest moisture content, which reduces the amount of material actually burned. Broadcast burning, handpile burning, and underburning would also be planned during the winter and spring months to reduce damage to the site from high intensity burning and to facilitate control of the units being burned.

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

4.21 Non-Native and Invasive Species

The Rogue North and South Watershed analysis documents both indicated that there are both invasive plants and animals known to exist in the watershed. Management plans exist for control of noxious weeds. The alternatives presented in this document would not stop or interfere with the management plan. No alternative would cause further introduction or spread of nonnative species. Regeneration harvest in Alternatives 1 and 2 may provided open area after site preparation that would allow wind-borne species such as thistle and tansy to become established. Within five years those plants that became established would be shaded out by brush and tree species adapted to the site. There is less of a concern for underburn areas and commercial thinning areas because of shading and the limited bare soil areas exposed. Soil disturbance through decommissioning and road renovation would provide bare soil areas for potential spread of weeds. Best management practices would be in place for stabilizing disturbed areas involved in decommissioning and new road construction whether temporary or permanent.

4.22 Hazardous and Solid Wastes

No dump sites or other areas posing hazardous or solid waste problems are known to occur within the planning area.

4.23 Irreversible and Irretrievable Commitment of Resources

Irreversible commitment of resources refers to those that cannot be reversed except, perhaps, in the extreme long term. Irretrievable commitment of resources are those that are lost for a period of time.

Because many of the fuels and vegetation characteristics of the planning area are dynamic in nature and will continue to change and develop regardless of specific management actions, no irreversible commitment of resources is anticipated. The overall integrity of the area and its ecological and aesthetic values would be retained under all alternatives.

Road construction directly impacts late-successional habitat, but would result in a relatively small irretrievable commitment of resources compared to the size of the area treated. Road construction, even for temporary roads, would have a long-term effect on the capability of that piece of ground to produce late-successional habitat. Similarly, regeneration or overstory removal harvest would constitute an irretrievable commitment of the late-successional habitat resource. Over the following 80 years or so, late-successional habitat conditions may be reestablished, given the typical harvest rotation. A lesser time would be required to make the area usable to many species inhabiting or utilizing adjacent late-successional habitat.

4.24 Cumulative Effects

4.24.1 Fire and Fuels

Under Alternatives 1, 2, and 4 there would be a reduction in the fire risk and hazard for the project area. With planned maintenance treatments, typically in the form of underburns, the reduced fire hazard resulting from fuels treatments would be maintained for approximately 10-15 years. If maintenance treatments were to cease throughout the project area, a gradual return to current levels of fire hazard could be anticipated over a period of 25 to 30 years. The fire hazard increase would be due, in part, also, to fire suppression activities. Harvesting and burning the logging slash would also temporarily reduce the overall potential for crown fires. Precommercial thinning treatments that might be expected to occur in the future (not associated with this action) could be expected to increase fire hazard if the slash were not treated. If treated, thinning would help reduce potential for stand-replacing fires.

Under Alternative 3, the fire hazard would not be reduced at this time, and would be expected to increase until fuels treatments could be accomplished. The continued growth of vegetation and the associated fuels accumulation would keep the fire hazard elevated, maintaining potential for uncharacteristic stand-replacing fires until these areas were treated. Rural interface management within the planning area would likely be fire and fuels management and related effects such as smoke, visual resource management and protection of views from within residences in the area.

Private parcels within the planning area range in size from about 20 to more than 300 acres, primarily near Marial, west of Kelsey Creek. Exceptions are mining claims in the Whisky Creek drainage, Black Bar Lodge and two parcels in the Meadow Creek Drainage. Many of the private parcels within the planning area are actively managed for timber or mineral extraction with entries occurring within the last 5 years.

The lack of road development in portions of the planning area would continue to prevent access to areas needing fuels treatment under all alternatives. Limited access would also interfere with initial attack resources, which may allow wildfires to burn larger areas because of the potential for slower response times. Under all alternatives, logging on adjacent private timberlands could be expected to increase potential for fires to spread into the planning area should logging slash not be properly treated.

4.24.2 Timber

Impacts of actions that have occurred throughout the watershed over the past 20 years are described in Appendix 14-1. The table reflects past timber harvest and related projects and road treatments in the project area since 1983. There were earlier harvests, going back as far as 1960. This affected approximately 3,300 acres of the watershed and harvested approximately 83,682 MBF during those 20 years. In addition, there were three major wildfires that occurred in the last century. Since 1959, silviculture treatments occurred, including seeding and planting over 7,700 acres.

Forest management continued after the clearcuts and fires of the past. Unit condition and stocking are monitored and treatments to promote growth and stand characteristics applicable to the land use allocation are done to meet the objectives of the allocation. Stocking classes will be updated as monitoring under the Forest Plan system provides new information. These treatments are continued until the unit has reached a growth level where commercial thinning or commercial density management become appropriate treatments. Some of the units regenerated in the late 1950s and 1960s are now ready for commercial thinning and commercial density management.

NFP standards are more linked to assumptions made in the Kelsey Whiskey EIS planning. Target stocking has 80-100% of the regeneration plots occupied by suitable trees. Minimum stocking has 60-79% of the regeneration plots occupied by suitable trees. Sub-minimum stocking is where less than 60% of the regeneration plots are occupied by suitable trees. To be counted as stocked, a plot must contain at least one tree of suitable attributes. A suitable tree is a tree species, adapted to the ecological site, considered capable of meeting forest management objectives. It may qualify as a component of the stand by having survived at least one growing season in the field. Current stocking standards are higher for Matrix allocated lands where production of timber is a primary objective and lower for reserve areas where there habitat and other non-timber objectives

4.24.3 Late Successional Habitat and Roads and Transportation System

Consideration of site level impacts is consistent with the NFP which noted “Negative cumulative impacts may be further minimized or avoided through coordination...with watershed...analysis and planning,” (USDA and USDI 1995).

This FEIS examined the site specific effects on Late Successional habitat from the proposed actions. In all four alternatives, there were no instances where the percentage of mature or late seral stage forest would be expected to fall below 50 percent. This would seem to indicate that even in conjunction with past harvests, the watershed would remain in a condition to support late successional affiliated species and to provide better than good quality of connectivity to the edge of its boundary over a short term period. Over the long term, the Wild Rogue North Watershed Analysis discusses the modeled projections on GFMA land (USDI 1999b pg 65-69). With 49 percent of the potential GFMA in Riparian Reserves, and allowing for connectivity/diversity block requirements, but not factoring in deductions for Survey and Manage species protection, all of the age classes would be expected to be at or under 100 years by the year 2100. In this same time-frame, the NFP projected that late successional reserves would be primary support for late successional affiliated species (USDA and USDI 1994).

Past timber harvest from the Trapper’s Trap timber sale in 1985 in the subwatershed adjoining the North Fork Kelsey Creek subwatershed has left 39 percent of the habitat in a late-successional condition. Past timber harvests on federal lands in the Upper Kelsey Creek and Long Gulch subwatersheds, along with both federal and private timber harvest in the Mule Creek subwatershed, have reduced the quality and quantity of late-successional habitat in the analysis area (USDI 1999b).

Road construction to support past timber harvest resulted in relatively high road densities in portions of the watershed. Road management activities of the more recent past have substantially reduced road related erosion and subsequent sediment transport. This was accomplished via surfacing, additional culverts and reduced vehicular access (Mule Creek drainage) by gating. Approximately 33 miles of roads were gated, barricaded or otherwise closed to improve elk habitat and to reduce road related impacts to the environment. Approximately 80 miles of roads were improved with the effect of minimizing road related erosion.

The temporary road construction proposals in Alternative 1 would, of themselves, represent a negligible impact to the watershed or to late successional habitat. Added to the impacts of previous actions, the impacts from constructing 1.5 miles of temporary road would be undetectable. If you assume, however, that over long term, harvest of GFMA follows the projected path identified in the NFP and the RMP, over the long term. The small number of roads on the east side of the watershed can be expected to increase significantly.

4.24.4 Other Cumulative Effects

Full riparian buffers adjacent to both perennial and intermittent streams and adjacent to proposed projects and harvest units, are currently well shaded with vegetation and would remain that way. Water temperature and other water quality values would be maintained and no cumulative impacts are anticipated. No cumulative effects are anticipated on fisheries within the Wild Rogue watershed including the Rogue River corridor. Cumulatively peak flows would not be increased at detectable levels within the planning area. Historic wildfire accounts for some subwatersheds that have very high percentages of open area. Stream channels in the planning area have adapted to these types of conditions and therefore can be expected to accommodate increases in peak flow should they occur.

