United States Department of Agriculture

Forest Service

Environmental Assessment

February 19, 2007

Loon Fuels Reduction Project

Upper Grande Ronde Watersheds

Union County, Oregon

Legal Location: Portions of T. 2 N. R. 38E sections 1, 2, 3, 10, 11, 12, 14, and 23; T. 3 N. R. 38 E. sections 11, 12, 13, 14, 23, 24, 25, 26, 34, 35, and 36; T. 3 N. R. 39 E. sections 3, 4, 5, 6, 7, 8, 17, 18, 19, 20, 21, 28, 29, 30, 31, and 32; T. 4 N. R. 39 E. sections 17, 19, 20, 21, 28, 29, 30, 31, 32, and 33, Willamette Meridian

Responsible Agency

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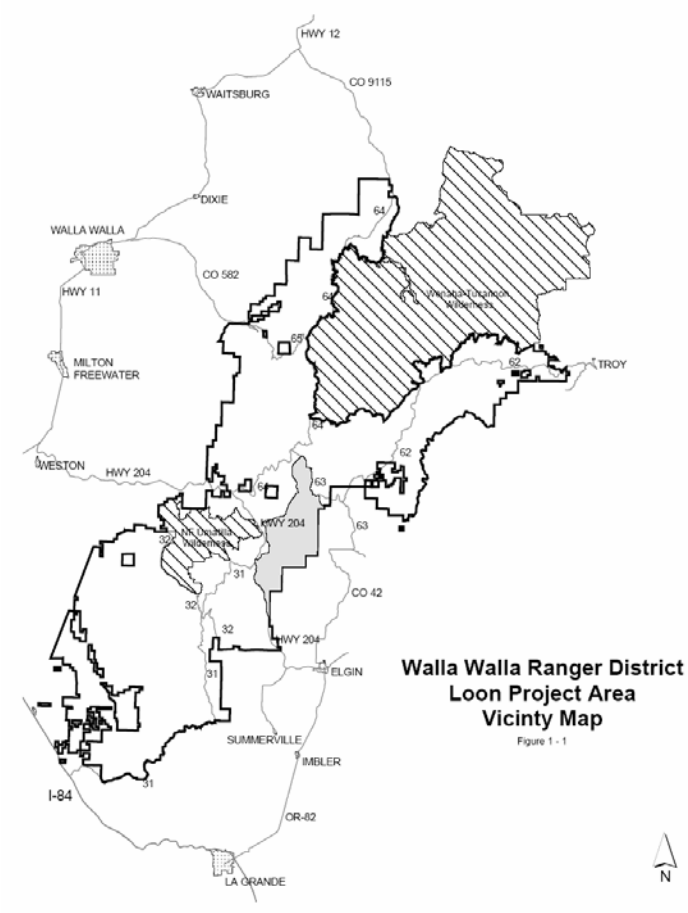
Chapter 1 - Introduction

Document Structure

The Forest Service has prepared this Environmental Assessment in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The document is organized into three parts:

- *Introduction:* The section includes information on the history of the project proposal, the purpose of and need for the project, and the agency's proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.
- *Comparison of Alternatives, including the Proposed Action:* This section provides a more detailed description of the agency's proposed action as well as alternative methods for achieving the stated purpose. These alternatives were developed based on significant issues raised by the public and other agencies. This discussion also includes possible mitigation measures. Finally, this section provides a summary table of the environmental consequences associated with each alternative.
- *Environmental Consequences:* This section describes the environmental effects of implementing the proposed action and other alternatives. This analysis is organized by significant issues. Within each section, the affected environment is described first, followed by the effects of the No Action Alternative that provides a baseline for evaluation and comparison of the other alternatives that follow.



- *Appendices:* The appendices provide more detailed information to support the analyses presented in the environmental assessment.

Much of the information and analysis presented in the document is summarized from specialist reports that can be found in the project planning record located at the Walla Walla Ranger District Office in Walla Walla, Washington.

Location

The Loon planning area is approximately 20,180 acres in size located in the upper reaches of Cabin, Gordon, and Little Phillips Creeks, the western tributaries of lower Mottet Creek, and Eagle Creek and lower Lookingglass Creek; all within the Upper Grande Ronde Subbasin. The planning area is bounded by State Highway 204 along the west, the Upper Lookingglass subwatershed boundary along the west and north, Forest Road 63 along the east and the Forest boundary, also along the east. Access to the

planning area is gained via three road systems; FR 3725 and 3727 from State Highway 204 and FR 6306 from FR 63. The planning area is divided into two portions by Lookingglass Creek; Lugar Springs is located in the northern portion and Balloon Tree in the southern portion. The project is located within Union County, Oregon. (See figure 1 and 2)

Table 1-1 Forest Plan Management Areas		
A2	OHV Recreation	123 acres
A3	Viewshed 1	615 acres
A5	Roaded natural	135 acres
C1	Dedicated Old Growth	678 acres
C2	Managed Old Growth	350 acres
C4	Wildlife Habitat	5,657 acres
C5	Riparian Wildlife	624 acres
E2	Timber Big Game	12,005 acres

Elevation in the planning area ranges from 5,100 feet near Jubilee Lake to 3,000 feet on Lookingglass Creek at the Forest boundary and 5,300 feet west of Balloon Tree to 3,800 feet on Highway 204 at the Forest boundary. Much of the forest type is moist forest characterized by a mixed fire regime. Southern exposures are dominated by grasslands and dry forest types. Much of the planning area is within the Palmer Valley/Valley View Wildland Urban Interface with the Tollgate/Spout Wildland Urban Interface adjacent to the west boundary. (See map in Appendix A)

Table 1-1 shows the Forest Plan Management Areas found within the Loon Planning Area (See Figure 1-3).

Background

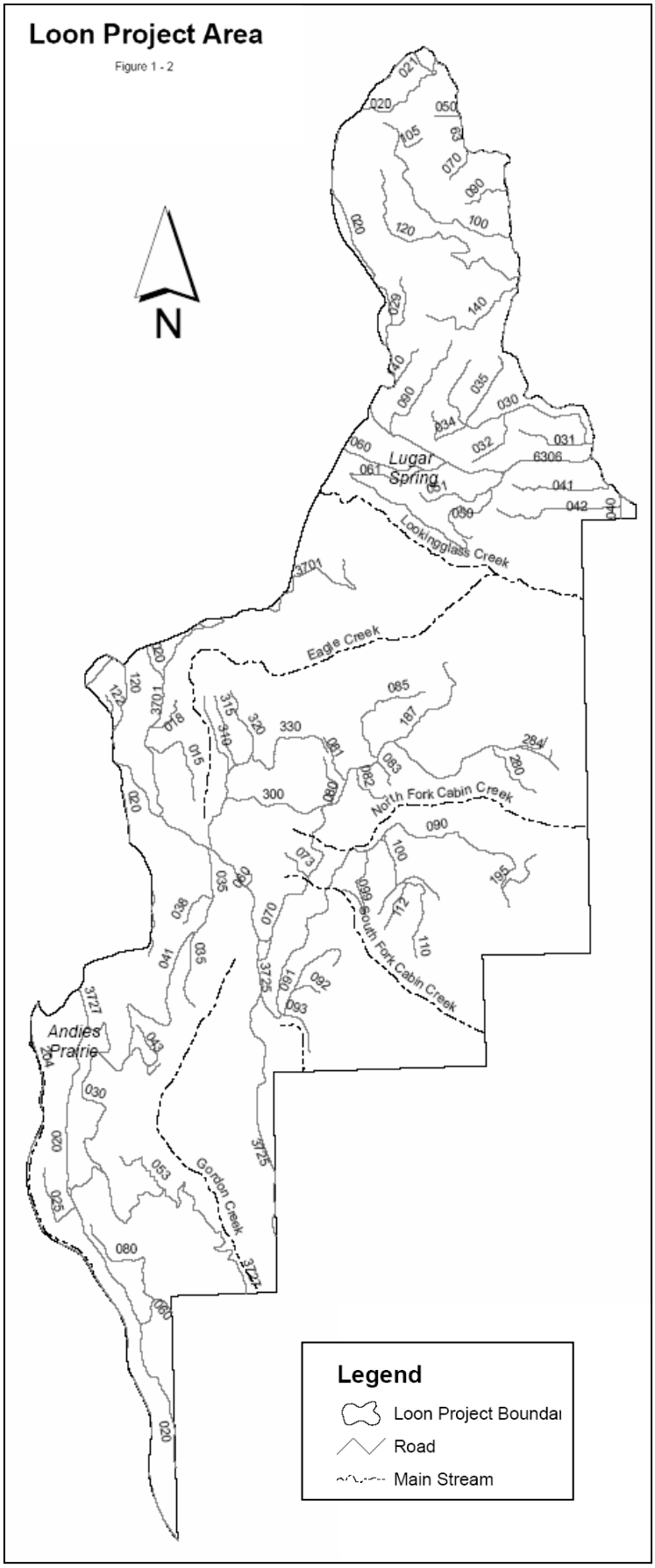
The Walla Walla Ranger District, Umatilla National Forest proposes treatments to reduce surface and aerial fuels within the Palmer Valley Wildland Urban Interface area, identified in the Union County Community Wildfire Protection Plan (CWPP), as well as improve stand conditions and manage for seral tree species in areas outside the WUI boundary. The Community Wildfire Protection Plan identified 16 Wildland Urban Interface areas incorporating multiple communities at risk. The wildland urban interface areas were characterized for an overall ranking looking at the landscape's wildfire hazard, the overall fire protection capability/structural vulnerability of the local community, the values the community identified as needing protection, how weather would play a role in fire behavior, and the opportunity for fuel reduction projects. The Palmer Valley Wildland Urban Interface Area is ranked number four when considering these factors. The Community Wildfire Protection Plan established an evaluation process to assess projects and establish priorities. Projects that furthered emergency response are the most important followed by identifying and reducing fuel hazards, fostering support for the CWPP, and using the plan as a resource tool. Projects or activities that would support emergency response include road system improvements to provide access or escape routes and water source developments.

Community at risk: a group of homes or other structures with basic infrastructure (such as shared transportation routes) and services within or near federal lands.

Wildland-urban interface (WUI): A WUI is the area where structures and other human development meet or intermingle with wildland or vegetative fuels. It surrounds a community at risk, including a community's infrastructure or water source and may extend beyond 1.5 miles of a community, depending on topographic features used as an effective firebreak or containing Condition Class 3 land posing a threat to the community.

Condition Class 3 lands: Within a WUI the fire behavior associated with condition class 3 is of concern. With this fire behavior there is a high risk for losing key ecosystem components. The typical wildfire could potentially be large in size with extensive areas displaying effects from a high intensity and severity fire. Crown fire would be likely and a wildfire can move quickly through an area threatening the identified community at risk. This type of fire behavior is not compatible with the objectives of a WUI. Even if the forest type is more characteristic of the mixed or infrequent fire regime, as is the case in this planning area, modifications and maintenance of fuel conditions that reduce fire intensity and increase the ability to safely suppress wildfires are important.

Projects that would breakup the landscape to confine wildfire or increase suppression capabilities would also be important when the total landscape cannot be treated at one time or the plant community types are not compatible with open structure stands or frequent fire regime fuel characteristics.



Interconnected areas that would bring fire to the ground and reinforced by suppression actions would aid in reducing the spread of wildfire and the movement of fire towards the communities at risk. Fuel reduction projects in the outer fringe of the Wildland Urban Interface would aid in reducing the risk of wildfire reaching the Palmer Valley, Valley View Road Area, and City of Elgin; communities identified by the CWPP as at risk.

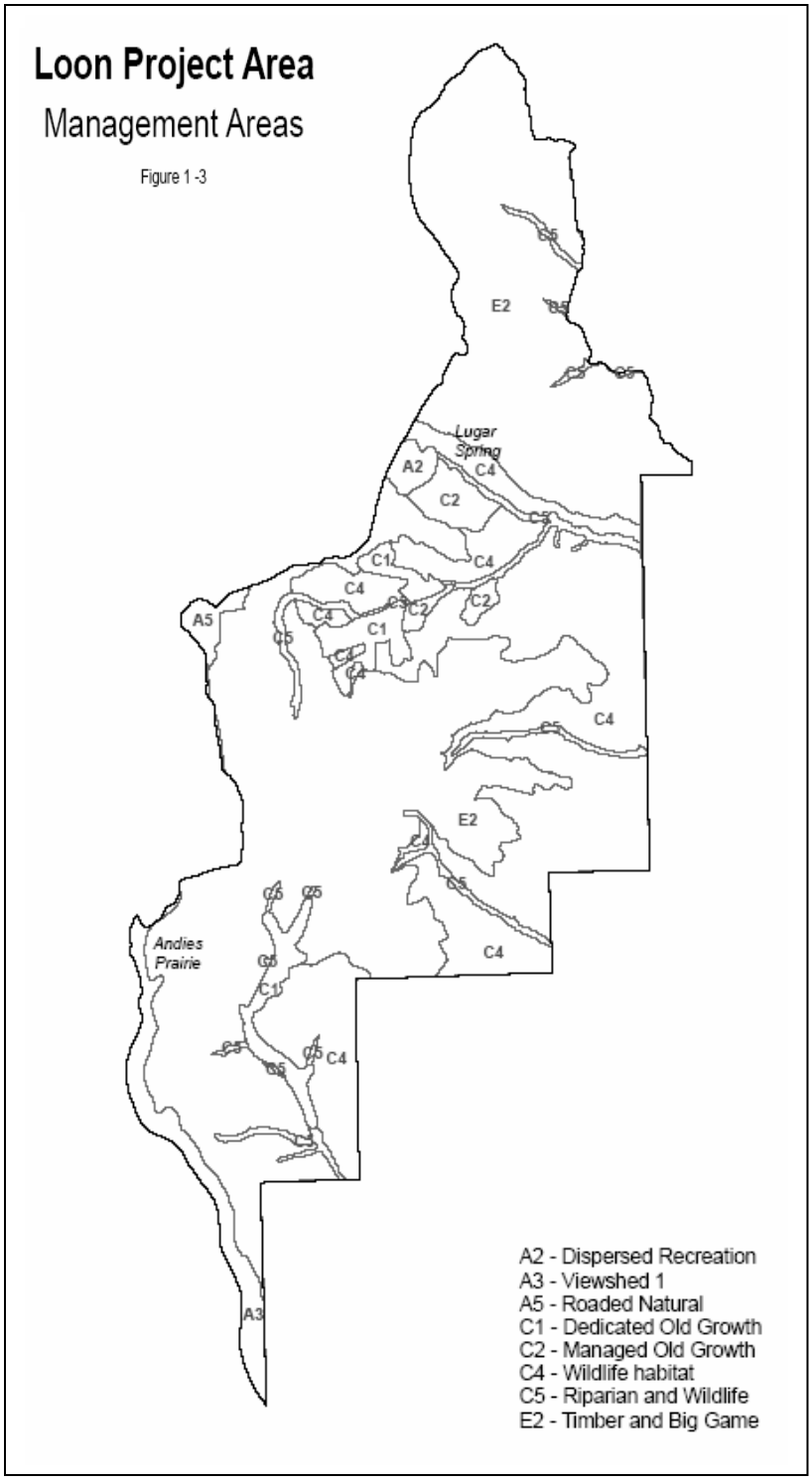
There has been timber harvest on private lands along the Forest boundary causing an increase of fuel loads from untreated slash. In addition to the timber harvest, the natural landscape within the WUI and on the National Forest is transitioning to more complex fuel structures approximately 70 percent of the planning area is condition class 2 and 3. The moist forest stands making up the mixed fire regime (approximately 70 percent of the planning area) are increasing in understory and intermediate tree density while surface fuels are getting more complex. The landscape as a whole is moving toward a fire behavior characteristic of Fuel Model 10, like that described for condition class 3.

The Community Fire Plan acknowledges that Union County depends on the landscape to sustain its livelihood. Much of the land is primarily suited for agriculture and forest products. Timber played a key role in Union County's early economic development but has steadily declined in economic value since the late 1970s. Wood products still remain the most prominent source of employment in the manufacturing sector for the county. Timber is a valuable resource in the County representing a commodity in the

form of raw materials and finished products as well as amenity resources such as the Grande Ronde Valley's scenic beauty and outdoor opportunities. Timber resources are also acknowledged for their important role in maintaining water quality and wildlife habitat. A large wildfire, of any magnitude, would severely impact the economy by reducing the amount of wood available for market, impacting tourism and recreational opportunities, as well as the quality of life of the local population. Individuals involved with the development of the CWPP indicated they valued the aesthetics of the Grande Ronde Valley, outdoor recreation, clean air and water, and vegetation and wildlife habitat; all of which they felt could be detrimentally affected by wildfire. (Union County Community Wildfire Protection Fire Plan)

Proposed Action

The Proposed Action uses fuels treatments within and adjacent to the Palmer Valley Wildland Urban Interface (WUI) and adjacent to Tollgate WUI boundary to reduce surface and aerial fuels on approximately 2,870 acres using various treatments including timber harvest and prescribed fire. Timber harvest would be used to reduce stocking levels and modify the fuel structure. Proposed vegetation treatments would involve the removal of commercial timber suitable for lumber or wood fiber, reduce the density of non-commercial size trees and reduce the existing and activity generated surface fuels. There would be approximately 4.8 million board feet of timber harvested from 2,870 acres. A forwarder would be used on 1,583 acres employing a cut-to-length system and a helicopter/skyline on 372 acres. Silvicultural prescriptions include: improvement cuts, commercial thinning, patch cuts, salvage cuts, and noncommercial thinning. Improvement harvests would improve stand composition and quality while retaining a fully stocked stand with small areas needing reforestation because of existing pockets of diseased trees. The proposed action would use approximately 47 miles of roads. According to the Access and Travel Management Plan, 29 miles are seasonally open, 18 miles are closed, and 3 miles are restricted roads. All of the roads in the area are available for



winter snowmobile use. Logging slash would be treated using a variety of methods including: understory thinning (1,390 acres), understory burning (250 acres), mastication/grapple piling (1,610 acres), burning of piles (1,670 acres), hand piling (250 acres), and jackpot burning (160). A total of 2,075 acres is proposed for fuels treatment, with many of the treatments overlapping within units.

The proposed action includes: 1. Approximately 1,800 feet of temporary road to access Unit 27. 2. Approximately 43 miles of road maintenance including surface rock replacement, spot surfacing, roadside brushing, erosion control, logging out, road surface blading, ditch cleanout, slide removal, dust abatement, culvert cleaning, or replacement, hazard tree removal, and other items that contribute to the preservation of the existing road and its safe use.

Purpose and Need for Action

This project is needed to reduce fuels and improve stand conditions within the Loon analysis area. It is designed to address the concerns and opportunities highlighted in the Union County Community Wildfire Protection Plan with a focus on reducing the risk of detrimental damage to communities and the environment from a wildland fire by enhancing or maintaining conditions that ease emergency response and reduces fuel hazards. The action would include measures to reduce the impacts from invasive plant species by incorporating a prevention plan into the project implementation plan. The action would be consistent with National, Regional, and Umatilla National Forest strategic plans.

The following landscape goals have been identified for the planning area through analysis of the existing condition by the Interdisciplinary Team assigned to the project:

1. Modify the intensity and resulting fire behavior to that characterized by Fuel Model 8 on portions of the landscape to allow suppression actions that would reduce the impacts and size of a wildland fire. This would provide a higher likelihood of containing a wildfire and provide greater safety for firefighters and protection of Wildland Urban Interface areas. Fuels reduction activities would be strategically placed to allow suppression actions that would reduce the impacts and size of a wildland fire.
2. Increase resilience of stands to disturbance from insect, disease, or wildland fire.
3. Improve stands dominated by western larch.
4. Provide “bio-mass” products for utilization by local industry.
5. Improve firefighter and public safety

Need for Forest Plan Amendment: A Forest Plan amendment to allow a timber sale to remove trees from the Little Phillips Creek Riparian Habitat Conservation Area (RHCA) adjacent to State Highway 204 is needed. A timber sale would be used to reduce crown density as part of fuel objectives and remove danger trees. Danger trees need to be removed because continuing to leave down trees adjacent to the highway, along a major escape route and adjacent to the Palmer Valley WUI, is not compatible with the Union County CWPP; creating areas for more effective suppression actions. The increasing amounts of fuels raise concerns for public safety when a wildfire occurs. The area adjacent to the highway has a high potential for fire starts, increasing the concern over leaving concentrations of fuels in this high use area that would take fire into the crown. A fire start along the highway would run upslope into the Palmer Valley WUI. PACFISH standards and guidelines do not allow timber harvest in Riparian Habitat Conservation Areas (RHCAs) in Standard and Guideline TM-1, and requires felled trees be kept on site when needed to meet woody debris objectives in Standard and Guideline RA-2. Timber harvest will be needed to remove these danger trees and reduce canopy density. The Forest Plan amendment will be needed to harvest the danger trees and reduce overstory canopy and ladder fuels within the RHCA using a timber sale and provide riparian habitat attainment goals more in line with highway maintenance.

Laws, Regulations, and Other Plans

This Environmental Assessment process and documentation has been done in accordance with the direction contained in the ***National Forest Management Act*** **(NFMA)**, the ***National Environmental Policy Act (NEPA)***, the ***Council on Environmental Quality (CEQ) Regulations***, the ***Clean Water Act***, and the ***Endangered Species Act***.

This Environmental Assessment is tiered to the ***Umatilla National Forest Land and Resource Management Plan FEIS*** and ***Record of Decision*** approved June 11, 1990 and the accompanying ***Land and Resource Management Plan (*****Forest Plan)**. This includes clarifying direction found in the following Forest Plan Amendments:

- ***Interim Strategies for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California*** **(PACFISH),** dated February 24, 1995 and
- ***Continuation of Interim Management Direction Establishing Riparian, Ecosystem, and Wildlife Standards for Timber Sales*** **(Eastside Screens)**, dated June 12, 1995.
- Direction for providing Invasive Plant Prevention Measures found in the Standards 1, 7, 8, 13, of the Record of Decision (ROD) for the Pacific Northwest Region Invasive Plant Program, Preventing and Managing Invasive Plants.

Clarifying direction provided in the **National Marine Fisheries Biological Opinion** for the Umatilla Land and Resource Plan (for portions of the Forest within the Snake River Drainage) is also included. The ***Managing Competing and Unwanted Vegetation FEIS (Veg FEIS)***, its ***Mediated Agreement***, and ***Record of Decision (December 8, 1988)*** guide the management of vegetation for fuels reduction and timber management.

Decisions to be Made

The Environmental Assessment documents the results of the environmental analysis conducted for the proposed action and its alternatives. The Responsible Official will determine which alternative best implements the Forest Plan at this time. Specific determinations needed are:

1. What, if any, Forest Plan amendments are necessary?
2. Whether harvest and fuel treatments within and adjacent to the Palmer WUI and adjacent to Tollgate WUI should occur, and if so, how much and where?
3. What monitoring measures should be taken?

Scoping

Scoping is used to identify major issues and determine the extent of environmental analysis necessary for an informed decision on a proposed action. Scoping for this project began May 25, 2007. The District received 2 written responses from a mailing to 115 individuals, organizations and governments including the Confederated Tribes of the Umatilla Indian Reservation and the Nez Perce Indians.

Tribal Involvement

The proposed project is within areas ceded to the United States government by the TREATY WITH THE WALLA WALLA, CAYUSE, ETC., 1855 and represented by the Confederated Tribes of the

Umatilla Indian Reservation (CTUIR). The Forest Service, through the Secretary of Agriculture, is vested with statutory authority and responsibility for managing resources of the National Forests. Commensurate with this authority and responsibility to manage is the obligation to consult, cooperate, and coordinate with recognized Indian Tribes in developing and planning management decisions regarding resources on National Forest system (NFS) lands that may affect tribal rights established by treaty or Executive Order. As a result of the treaties and Executive Orders, elements of Indian culture, such as tribal welfare, land, and resources were entrusted to the United States government. The Forest Service shares in the federal government's overall trust responsibility of assuring tribal cultural customs can be maintained utilizing the reserved rights expressed in the treaties.

The treaty states "That the exclusive right of taking fish in the streams running through and bordering said reservation is hereby secured to said Indians, and at all other usual and accustomed stations in common with citizens of the United States, and of erecting suitable houses for curing the same; the privilege of hunting, gathering roots and berries, and pasturing their stock on unclaimed lands, in common with citizens, is also secured to them." (TREATY WITH THE WALLAWALLA, CAYUSE, ETC., 1855). It is the responsibility of the Forest Service to take into account cultural resources when managing the Forest's natural resources and to address tribal interests when managing and restoring habitat to support healthy, sustainable, and harvestable populations of culturally significant vegetative floral and faunal species.

Utilization of National Forest System lands for all Federally recognized Tribes is protected by American Indian Religious Freedom Act, Executive Order 13007 – Sacred Sites, Executive Orders 13084 & 13175 – Consultation and Coordination with Indian Tribal Governments, and Executive Order 12898 – Environmental Justice and the National Historic Preservation Act which includes protections for properties of traditional religious and cultural importance.

The District involved the CTUIR early in its planning process by meeting with the tribal Cultural Committee on two occasions. On April 17, 2007 District Ranger Mary Gibson (retired) and District staff met with them to discussed the project which lead to a field trip on May 9th. The field trip focused on two areas; the Lugar Springs area and Highway 204.

Discussions centered primarily on first foods though other issues were discussed. At Lugar Springs the District reviewed proposed prescriptions and treatment areas. The committee inquired about locations of huckleberry and the possibility to increase their production. Several units (4, 27, 28, & 33) were identified as having suitable plant community types that support huckleberries; however their prescription would not open the stands. The stands in question provide important cover values for big game and are within connective corridors for late old structure. Due to past forest management activities forest cover values are important in this area so these stands are not proposed for prescriptions that would open the canopy. Stops overlooking Lookingglass Creek and at Little Phillips Creek along Highway 204 lead to discussions about salmon and steelhead. These are also important cultural resources. The committee reminded us that they have reintroduced salmon to Lookingglass Creek. The fish they used are native to the system. Other matters of importance to the Tribe were discussed at this meeting, but none generated any changes to the proposed action.

The Tribal leaders of the Nez Perce and Confederate Tribes of the Umatilla Indian Reservation (CTUIR) were sent letters during scoping; neither tribe responded. Comments and concerns expressed early in the planning process and for other activities centered on impacts to natural resources important to sustaining cultural activities and performing management actions that would improve those resources.

- The Forest Service has Federal Trust Responsibility to take into account the Tribes' treaty rights when decisions are made such that cultural practices can be exercised and that treaty related resources are protected and/or improved. Actions should not hinder the ability of the tribes to access and use traditional use areas. The CTUIR expresses its concern through the cultural aspects of First Foods and their importance on the land that sustains their culture. First Foods –

water, salmon, deer, cous, and huckleberry - represent groupings of similar species that are served in their Longhouse and the production of these resources represent a healthy environment; important to their cultural traditions.

- The establishment of fishable runs of salmon is important to the CTUIR. They have worked with state and local governments to develop support of restoration of salmon in streams throughout their ceded lands; their work in the Umatilla River and Meacham Creek systems, Walla Walla River, and Lookingglass Creek highlight a few of their successes. They feel that protection of pristine riparian and upland habitat is important to the recovery of fish populations. They support the Northwest Power Planning Council's approach to Subbasin planning that focuses on connecting areas of high quality habitat and working toward population goals through both natural and hatchery production.

Tribal concerns have been incorporated into all alternatives through the use of Project Design Features (See Chapter 2). Potential impacts to plants, animals, and fish are disclosed in Chapter III – Environmental Effects.

Identification of Issues

The Interdisciplinary Team reviewed the comments and identified significant issues, resources of concern, proposal clarifying comments, or comments that for some reason would not be carried through the analysis. Significant issues are those concerns that would generate an alternative to the proposed action. Resources of concern are those resource values that commenters thought would be impacted and wanted to be considered in the analysis and decision. Proposal clarifying comments helped to refine the project proposal either through clarifying the project description or adding Project Design Features. Some comments were not carried into the analysis because they were: 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. The Council on Environmental Quality (CEQ) NEPA regulations require this delineation in Sec. 1501.7, "…identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)…"

After a study of the public comments and resource concerns by the IDT, the District Ranger determined the following significant issues:

Significant Issue 1: Concern over Fuel treatments within the Little Phillips Riparian Habitat Conservation Areas (RHCAs)

There is conflict with the need to treat fuels within the Little Phillips Creek RHCA by removing danger trees, reducting of crown density for lowering the risk for crown fire, and pile and burning of surface fuels. Little Phillips Creek is a Snake River steelhead and redband trout stream adjacent to Oregon State Highway 204. Steelhead are known to spawn downstream of the Planning Area and redband occupy the upper reaches. Extensive portions of the stream go dry by late July and early August with water remaining in scour pools. Year round rearing habitat occurs in the upper reaches of Little Phillips Creek and tributaries outside of the Loon Planning Area. Any harvest removal within the RHCA would not be consistent with standards and guidelines found in the PACFISH standards and guidelines and would require a Forest Plan amendment. Two alternative themes were developed representing different treatment levels of both aerial and surface fuels within the RHCA. Alternative C would fall and remove danger trees within the RHCA when the stream is between the road and the unit and would allow canopy reduction when the road is between the unit and the stream. Alternative D would only cut and leave danger trees within the RHCA; the tree would only be removed if it posed a safety concern to traffic or could damage the road. Both alternatives would allow trees to be felled into the channel where they

posed no risk to damaging the road and hand piling of surface fuels. The forest plan amendment would allow timber harvest methods to be used in the RHCA to remove danger trees and/or reduce crown density. These alternatives contrast the effects of different harvest intensity within the RHCA in both the perennial and intermittent portions of Little Phillips Creek while accomplishing public safety needs and reducing surface fuel levels.

The unit of measure to display differences between alternatives would be the miles of danger tree reduction along Highway 204, Acres of reduced crown density within Little Phillips Creek RHCA, acres of fuel surface reduction within the RHCA, and total acres of fuel reduction within the RHCA and the ridgetop above Highway 204.

Significant Issue 2: Concern with the proposed action for the loss of big game cover and late old structure as well as how the reduced canopy closure would encourage the development of future ladder fuels.

There was concern voiced about the proposed ladder fuels and stand density treatments that open forest canopy and the resultant conditions favorable for the development of understory growth that would become future ladder fuels. The concern centers on managed forest conditions that may not provide the desired fire behavior and that opening the canopy through harvest increases the risk of catastrophic fire through the drying effect that increased sunlight and wind on fine down fuels. There was also concern voiced about the harvest of trees that may supply wildlife cover in these stands. Satisfactorily big game cover is very close to the Forest Plan minimum standards. Proposed treatments would reduce satisfactory cover that is already below the desired level for Management Area E2.

Alternative D is responsive to this issue by retaining units that have fuel reduction as the primary objective, eliminating the units having stand density management objectives. More canopy closure is retained by reducing the amount of acres proposed for harvest and stocking level control. This does not fully respond to the concern about the future development of ladder fuels. Natural stands respond to created openings by a flush of new growth to take the place of trees that blow down, or are killed by insects, disease, or wildfire. A treatment now, does not remove the need for a treatment in the future to maintain the desired condition nor does it establish a future need that is dependent upon future social needs and desires. The no action alternative is also responsive to maintaining canopy cover to retard the development of future ladder fuels and would fit under a concept that unmanaged stands have less esxtreme fire behavior than managed stands.

Differences between alternatives would be displayed by:

- The numbers of acres of satisfactory and total cover reduced and percent of the analysis area. Satisfactory cover are stands with greater than 70 percent crown closure and would be a proxy for stand canopy conditions that would inhibit understory growth.
- Number of acres treated in stands currently typed as being in stem exclusion. These are stands with either canopy or climatic conditions that would inhibit understory growth and lumps dry forest, moist forest, and cold forest types.
- Percent of the treatment that is located in stands that do not have a canopy sufficient to retard understory development.

Other Public Comments Received during Scoping

Other comments received during scoping included questions and discussions about the way the Forest Service proposed to do analysis. The process used in this document is consistent with regulations and direction given in Forest Service manuals and the code of federal regulations. Resource concerns expressed during scoping will be discussed under its specific resource group described in the next

section. There were concerns expressed that did not fit within any of the resource groups but can be responded to here without further analysis.

- There was concern voiced about the use of the Healthy Forest Restoration Act (HFRA) authority to conduct this project and the failure of HFRA to provide a scoping period. *Answer: This project will not be carried out using HFRA/HFI authority, but will seek to fulfill the goals embodied in the spirit of the legislation. Concerns over the processes set forth by HFRA is beyond the scope of this analysis, it was set by law.*

- There was concern about the scale of the project and whether or not all available acres are being treated. *Answer: Any action will need to be consistent with the Forest Plan and if there is an overriding need a forest plan amendment is proposed as part of that action. The interdisciplinary team process helps to determine when an overriding need occurs. The Forest Service through a complex mix of laws, regulations, executive orders, and treaties has management obligations that will make it appear to some that not all opportunities are being exercised even though they were considered when a project has proposed. While not every acre within the planning area that would fit our purpose and need is being treated the action is being focused in areas that would accomplish suppression, fuels, socking level, and public safety goals in support of the Union County CWPP and the Purpose and Need while minimizing impacts to resources as directed in our Forest Plan.*

- Concern was voiced about the Loon projects carbon footprint as it relates to the CO2 emissions of harvest vs. fire. It was felt that the amount of CO2 delivered to the atmosphere from a wildfire would exceed the amount used by the logging process. *Answer: The comparing of CO2 emissions between gas and diesel powered engines and contrasting it with a wildfire of unknown scale with particulate emissions make this type of analysis to speculative and questionable. Such an analysis would provide the decision little to no value. There are just too many variables associated with carbon emissions that could include connected components of the local economy (haul, manufacturing, and marketing) as well as the portion of indirect economic benefits that support the timber industry. There is also the benefit realized from stand management actions that would increase carbon sequestration by increasing or maintaining growth rates that would also be considered in balancing carbon emissions. Modeling carbon emissions for the project would not be simple and would require assumptions that science may not be able to support. The information is not available for the various pieces of machinery as well as what assumptions could be made about indirect associated actions and manufacturing. Any attempt to place this project in the context of global warming would have to focus on portions related to carbon fixing and storage. The scale of this action will likely be immeasurable when considered at a global scale. There are things that can be disclosed that would help to demonstrate whether the action has a positive or negative affect on global warming but impossible to place its contribution in the context of cumulative effects because knowing all the sources globally is beyond available science and would be too speculative to be meaningful. Any discussion can only focus on the factors that this project can directly control.*

- Concern was voiced about harvest entry in Inventoried Roadless or undeveloped areas. *A portion of the Lookingglass Inventoried Roadless Area falls within the Loon Planning Area. No activities are proposed in this inventoried roadless area. There are several undeveloped areas larger than 1,000 acres, one in Gordon Creek and another in Cabin Creek. The boundary of these undeveloped areas are a minimum of 300 feet from existing roads or to the break in slopes when ridge top treatments are needed to provide a fuel break within the Palmer Valley wildland urban interface. The treatments are proposed to provide a defensible area to control a wildfire moving through the planning area. Past timber harvest is evident in the areas proposed for fuel and stocking level treatments. Oregon Wild identified Units 27, 33, 34, and 35 as falling within*

areas considered undeveloped using the edge of roadways. For a road system to be effective as a fuel break, a minimum of 300 feet is needed either side of the road. Unit 27 was commercially thinned in 1962 and 1970 with a system road rapping around the edges. The ridge top unit is adjacent to other past harvest and is considered within a forest management area, it does not have undeveloped character. Unit 33 has been harvested in the 1990s along with other units along the ridgetop in the area of Spout Springs Ski Area. Unit 34 is included in Alternative D and completes a fuel break along a ridge system. Adjacent harvest units are proposed for noncommercial thinning. Unit 35 is also a fuel reduction unit in Alternative D and is surrounded by roads and power line. The resource value important to these undeveloped areas is fisheries habitat. The fuel and timber harvest activities are distant to Cabin and Gordon Creeks, mainly on ridgetops. Unit 34 would have a PACFISH Riparian buffer along the bottom of the unit that would protect fisheries habitat. The proposed harvest prescriptions are improvement and commercial thinning, removing only a portion of the stand and green trees 21 inches and larger would not be cut. None of the units of concern are considered being within an undeveloped area and a forested canopy would be retained though it would be thinned and surface fuels treated.

Resource Protection and Goals Identified in the Forest Plan

Many comments stressed the need to address impacts to soil, wildlife, ESA and sensitive species, water, fisheries, noxious weeds, and snags. Impacts to these resources of concern will be disclosed using resource grouping used in the Forest Plan; doing so will also help demonstrate how this action would be consistent with the goals and desired conditions identified in the Forest Plan.

During the forest planning process Forest Management Objectives and Standards and Guidelines were developed for various natural resources of the Umatilla National Forest. The standards and guidelines established measures of acceptable impacts to these resources while providing Forest outputs. These resources are listed in the table of contents for Forest Management Direction found on pages iii and iv of the Land and Resource Management Plan, Umatilla National Forest. Impacts to these resources will be disclosed in relation to established Forest Plan goals. Review of the Forest Plan indicates potential impacts to the following resource groups:

Wildlife Habitat Goal: Maintain or develop effective levels of well distributed wildlife habitat throughout the forest to maintain viable populations of all existing native and desired non-native vertebrate species. The Discussion of effects begins on page 74.

Riparian and Fish Habitat Goal; Provide and maintain a diverse, well distributed pattern of fish habitats. The goal applies to all areas dominated by riparian vegetation, including areas containing anadromous and resident fish, perennial and intermittent stream courses, wetlands, and floodplains. The Discussion of effects begins on page 63.

Riparian goals, management objectives, and standards and guidelines for projects have been identified in PACFISH. Compliance with PACFISH guidelines would be met by not harvesting nor allowing ignitions within Riparian Habitat Conservation Areas (RHCA).

- Significant Issue 1 will be addressed here

Ecosystems and Diversity Goal: Provide for diversity of plant and animal communities and tree species consistent with overall multiple-use objectives for the Forest. Maintain or enhance ecosystem functions to provide for long-term integrity (stability) and productivity of biological communities. The Discussion of effects begins on page 92.

Timber Goal: Provide for production of wood fiber consistent with various resource objectives, environmental constraints, and considering cost efficiency. The Discussion of effects begins on page 102.

Water Goal: Manage National Forest resources to protect all existing beneficial uses of water and to meet or exceed all applicable State and Federal water quality standards. Within the Forest capability, maintain or enhance water quantity, quality, and timing of streamflows to meet needs of downstream users and resources. PACFISH goals and objectives for riparian areas apply here as well. The Discussion of effects begins on page 52.

Soils Goal: Manage National Forest lands to maintain or enhance soil and land productivity. The Discussion of effects begins on page 49.

Transportation System Goal: Provide and manage a safe and economical road and trail system and facilities needed to accomplish the land and resource management and protection objectives on the Umatilla National Forest. The Discussion of effects begins on page 106.

The proposed road obliterations would affect the amount of access for various users, such as Tribal members, hunters, contractors, permittees, fire wood cutting, and dispersed recreation.

Fire and Fuels Goal: Provide and execute a fire protection and fire use program that is cost efficient and responsive to land and resource management goals and objectives. The Discussion of effects begins on page 42.

Air Quality Goal: Maintain air quality at a level adequate for protection and use of national forest resources and meet or exceed applicable Federal and State standards and regulations. The Discussion of effects begins on page 47.

Pest Management Goal: Protect forest and range resources from unacceptable losses due to destructive forest pests. This includes noxious weeds and insects. The Discussion of effects begins on page 99.

Threatened, endangered, and sensitive species Goal: Maintain or improve habitat for all threatened or endangered plant or animal species on the Forest, and manage habitats for all sensitive species to prevent their becoming threatened or endangered. The Discussion of effects begins on page 73, 87, 98 and 109.

Visual Resource: The Forest Plan (pages 4-22 and 4-23) provides visual quality objectives for State Highway 204. State Highway 204 is listed as a sensitivity level 1 with retention in the Foreground and Partial Retention in the Middle Ground. The goal for visual quality is found in Management Area A3, Viewshed 1. Scenic qualities would be maintained as a natural appearing landscape. Forest Plan pages 101.

Chapter 2 - Comparison of Alternatives, including the Proposed Action

This chapter describes and compares the alternatives considered for the Loon Fuels Reduction Project. It includes a description (including design features) and map of each alternative (See Appendix B) considered as well as a description of alternatives considered but eliminated from detail study. This section also contains a comparison of alternatives so that the decision maker and reviewer can easily see how alternatives differ in design and effects and how they are responsive to significant issues and the Purpose and Need. The comparison of effects is only a brief summary; a more detail disclosure of effects is found in Chapter 3 - Environmental Consequences.

Alternatives Eliminated from Detailed Study

Loon Landscape Treatment:

An early proposal was developed to encompass much of the eastern portion of the planning area with landscape prescribed fire treatments from the top of ridges to the Forest boundary. There would be a harvest component to remove stand structure and ladder fuels in preparation to the burn. Mortality was expected to be high from the burning; removing the small diameter trees would be beneficial to reducing after fire fuel loads. Fuel reduction objectives were focused on the forest boundary, ridge system and stocking level controls; approximately 3,000 acres of landscape burning was proposed, 1,700 acres of ridgetop fuel reductions and 1,200 acres of harvest for stocking level control. Approximately 5,500 acres of total treatments were proposed.

The alternative was eliminated from detailed study due to operational difficulties related to fuel treatments on rough terrain, predominately in mid slope location, and its proximity to the forest boundary. Additional conflicts included the proposed entry and treatment of Late Old Structure (LOS), Undeveloped Areas, and areas of satisfactory cover for wildlife. The project was of a scale that would have caused big game satisfactory cover to drop below minimum forest plan standards and not meet the objectives of the eastside screens for late old structure. Protection of other resource values, safety concerns about burning to a mid-slope forest boundary, and the extensive burning with additional slash from pretreatments in a forest type not adapted to fire caused this alternative to be eliminated from detailed study.

Maintain Old Growth Structure in Understory:

This alternative would focus on removing a range of understory vegetation, 8 to 14 inches in diameter preserving the opportunity to develop or retain any existing old structure (overtopped) characteristics found in the stand's understory. This alternative did not meet the Purpose and Need. Leaving sapling to small diameter understory trees does not meet the fuels objective. This size material often serves as a 'ladder' to the crowns of larger trees in the overstory; leading to fire behavior unfavorable to fire suppression efforts. The removal of understory vegetation needs to occur to achieve the desired spacing between the ground and the canopy. Past monitoring of stand treatments for fuels and stocking control indicates that understory is retatined. Trees that are not a concern for ladder fuel are left. When the stocking level of small diameter trees are low and they are not likely to compete with the overstory, they are not removed either. Desired tree species in the sapling and pole stages are usually left for future replacement of the overstory. Most of the stands proposed for treatment are young forest stands having little understory structure. These are stands that have developed from past stand replacement events causing a stand of uniform age classes with little to no diversity in the age classes in the understory.

This alternative was eliminated for detailed study. A focus on retaining understory would not result in an alternative that would be different from what is being proposed. The commercial tree removal would still remove the same size classes of trees. Even though there would be removal of saplings and poles that contribute ladder fuels, a component of this regeneration would be retained. The stands proposed for the heaviest removal of saplings and poles are young forest stands or plantations that are dominated by this small size class and the treatment is necessary to break crown continuity.

Treatment of RHCA along Highway 204 (east and west side):

A need was identified to conduct fuels treatments in the RHCA of Little Phillips Creek located along State Highway 204 that would move the planning area boundary to include the west side of Highway 204. State Highway 204 runs across the district from forest boundary to forest boundary either crossing or coming near three WUI areas; the Pumpkin and Palmer Valley WUIs in Union County and the Tollgate/Spout WUI in Umatilla County. There has been significant tree mortality along the road generating high levels of standing and down dead trees. There is continual concern about public safety along Highway 204 from falling trees and the increase of fuels because of potential fire starts along this major thoroughfare. Fire could move quickly from the roadside areas and be difficult to control. The highway is also an import escape and access route for fire suppression activities.

Through review of previous analysis conducted for the Pedro-Colt project (the area west of Highway 204) soil stability concerns were discovered that precluded treatments above the western portion of Highway 204. The Pedro-Colt analysis did not indicate a driving need to enter the Little Phillips Creek RHCA for hazard tree or other removal. The western tributaries of Little Phillips Creek also contains rearing habitat for and tree mortality is not as high in this area as it is to the east of the highway. As a result, treatments west of the road were not considered, leaving only treatments for the eastside of the highway; the planning area boundary was not extended.

ALTERNATIVE A- No Action

Alternative A is the "no action" alternative required by the National Environmental Policy Act of 1969. It represents the existing situation, uses, and environmental processes. No new management actions would take place. Current management direction and existing activities such as grazing, fire protection, and road maintenance would continue. Current biological and physical processes, creating stand disturbance and change, would be allowed to continue.

ALTERNATIVE B- Proposed Action

This is the same alternative used for scoping except for a few changes needed after additional field review. There would be a need for a 1,800 foot temporary road to access Unit 27 and 28 reducing the amount of forwarder routes and decking areas within the Gordon Creek RHCA. FR 3725038 will need a temporary culvert installed to access Unit 26. Skyline logging will also be considered as a possible logging system along with helicopter.

Alternative B would involve the removal of commercial timber suitable for lumber or wood fiber, reducing the density of non-commercial size trees, and reducing existing and activity generated surface fuels, down and standing woody debris, and aerial fuels. Commercial timber would be removed using helicopter, skyline, or cut-to-length logging systems. The biomass component would remove non-sawlog material down to 3 inches small end diameter. Non-commercial size material and surface fuels would be reduced using prescribed fire, hand thinning, mastication or grapple piling followed by the

burning of the piles. No green trees larger than 21 inches in diameter will be removed. The treatments would favor early seral tree species (ponderosa pine and western larch) and maintain fuel condition characteristics that would result in surface fires that burn with an intensity that would allow safe and successful suppression actions to be taken.

Table 2-1: Summary of Proposed Treatments

Treatment Activity	Acres of Harvest	Estimated Volume
Commercial Harvest		
Helicopter/Skyline	461	1,435,000 board feet
Cut-to-length	1463	3,625,000 board feet
Total Commercial Harvest	1924	5,060,000 board feet
Other Activities		
Pre-commercial Thinning	795	
Total For Proposed Action	2719	

Forest Plan Amendment: Vegetation actions for danger tree management and the reduction of fuels along Highway 204 within the Little Phillips Creek RHCA requires a forest plan amendment. This area of the highway has experienced many years of tree mortality and increases in surface fuels. The ridgetop to the east of the highway is the boundary for the Palmer Valley WUI and the boundary for the Pumpkin WUI area is to the southwest of the Planning Area. There is a need to cut the danger trees but also reduce fuels so safe, effective fire suppression can occur. A timber sale provides the best method to reduce fuels on the slope above the highway and remove any danger trees that cannot be utilized for large wood in the stream. The fuel reduction prescriptions include treatments in the RHCA because of potential fire starts and the need to keep potential fire intensity and severity low. Currently there are three PACFISH standards and guidelines providing direction for the action; timber harvest (TM-1), fuels treatments (FM-1), and danger trees (RA-2). See Appendix C for the full text of the current PACFISH standard and guideline. The proposed timber sale and prescriptions are not compatible with the PACFISH standards and guidelines because:

- The silvicultural objectives and long term desired fuel condition is not consistent with TM-1 b because the desired condition is for low surface fuels and low crown density. To reduce the risk to crown fire, both overstory crowns and understory vegetation would be managed to reduce ladder fuel conditions. This is not the same objective in TM-1 b which states to apply silvicultural practices to acquire desired vegetation characteristics where needed to attain retain Riparian Management Objectives (RMOs). The action is not a salvage which is an exception in TM-1 a.
- Using Timber harvest is not compatible with TM-1 and is the preferred method for removal. FM-1 would allow service contracts to remove the fuels, but the decked material would be sold and would look like a timber sale. A new exception category is needed for TM-1 and the fuels reduction needs to recognize that RMOs cannot be attained here because of the highway.
- The removal of danger trees may not be compatible with RA-2 which requires felled trees to be kept on site when needed to meet large woody debris objectives. Large wood can be retained in portions of the stream where they do not pose a safety concern for traffic or could damage the road. The amendment needs to recognize that danger trees cannot be left at levels that would attain objectives.

PACFISH RMOs are currently not being attained because State Highway 204 is located within the floodplain of Little Phillips Creek. Large wood that can deflect flows undercutting and damaging the

highway is removed. The highway alignment has channelized the stream and in places has cut tunnels for the stream so there is room for both the road and stream. Winter snowplowing and sanding add sediment into the stream. All of this impacts fisheries habitat and attainment of RMOs. The Forest Plan amendment recognizes that continued road maintenance would not allow Little Phillips Creek to attain PACFISH RMOs. The amendment is needed to allow needed forest management for public safety and fuel reductions knowing that the management actions can be designed move portions of the stream toward RMOs but likely unable to attain full RMOs as long as the road shares the floodplain.

Proposed Forest Plan Amendment: The forest plan amendment would allow the use of a timber sale to remove trees from the Little Phillips Creek RHCA, allowing silvicultural practices to improve public and fire fighter safety, and allow the use of various fuel treatment practices to manage for desired fire conditions for effective suppression efforts. This amendment applies to Little Phillips Creek and Highway 204 until the Forest Plan is amended again or revised. This amendment recognizes that the location of Highway 204 hinders the attainment of PACFISH RMOs and where and when the Forest Service has the ability, portions of the streams would be improved but likely never to the full PACFISH RMOs. The following PACFISH standards and guidelines would be added or changed for the Little Phillips RHCA along Highway 204.

TM-1 Add the following exception

c. Silvicultural practices may be applied within the riparian habitat conservation area of Little Phillips Creek to achieve the purpose and need of providing greater public and fire fighter safety along highway 204 and Wildland Urban Interface Areas. Implementation of silvicultural practices will be designed to minimize detrimental effects to riparian and fisheries habitat conditions and where possible enhances those conditions.

FM-1 Add the following to FM-1 for Little Phillips Creek.

a. Design fuel treatment and fire suppression strategies, practices, and actions in the riparian habitat conservation area of Little Phillips Creek along Highway 204 to minimize detrimental effects to riparian and fisheries habitat conditions and where possible enhances those conditions.

RA-2 Add the following to RA-1 for Little Phillips Creek.

a. Trees may be felled and removed when they pose a safety risk in the riparian habitat conservation area of Little Phillips Creek along highway 204 in such a manner that existing woody debris conditions are maintained or enhanced.

Timber Harvest

The proposed silvicultural treatments have been prescribed to respond to the purpose and need as determined by existing stand conditions. Methods selected are improvement cuts, commercial thinning, patch cuts, salvage, and non-commercial thinning. There will be no harvest in Late Old Structure (LOS) and no harvest of green trees 21 inches and larger in diameter. Occasionally, dead trees greater than or equal to 21 inches would be removed. These prescriptions have been made in conjunction with fuels treatments described below to maximize the forest health and fuels reduction effectiveness of each operation.

Table 2-2: Summary of Proposed Stand Prescriptions for Alternative B

Treatments	**Number of Units**	**Unit Acres**	**Treatment Acres**	**Volume** Board Feet
Improvement Cut	20	1245	1245	3,940,000
Commercial Thinning	7	484	484	625,000
Patch Cuts	2	226	75	375,000
Salvage	2	120	120	120,000
Subtotal	31	2075	1,924	5,060,000
Non-commercial thinning	34	795	795	na
Total	65	2870	2717	5,060,000

Improvement Cut: This is an intermediate treatment in stands past the sapling stage to improve their composition, structure, condition and health. Trees of undesirable species, form or condition are removed from the main canopy. Objectives include increased growth and vigor to reduce the risk of epidemic insect infestations, removal of shade tolerant and fire intolerant tree species, shifting stand composition to a greater representation of early seral tree species (generally ponderosa pine and western larch) and disease resistant species, and reducing ladder fuels and spacing the overstory trees to help reduce the possibility of a crown fire.

Commercial thinning: This is an intermediate cutting that stimulates growth and development of residual stands. Commercial thinnings are also made to increase the sawlog yield of usable (merchantable) material that would be available at a future harvest. A fully stocked stand remains. Some stands will be thinned to recommended stocking levels based on plant association and tree species being managed. Other stands will be thinned to a stocking level consistent with the fuel reduction objectives.

Patch Clearcut: This treatment would remove part of a stand using patches that are less than 5 acres in size. These stands are designed to increase the stand composition of western larch. Approximately a third of the stands acres would be included in a patch cut.

Salvage Cut: the removal of dead trees or damaged and dying trees (those displaying evidence of insects, disease or decay) to reduce fuel loadings and to recover economic value that would otherwise be lost.

Noncommercial thinning: The cutting of trees ranging in diameter breast height from 1 – 5 inches. The focus of the thinning is to reduce competition, remove ladder fuels, or create breaks in the continuous canopy of small diameter trees. Both hand and mechanical methods would be used. Mechanical mastication equipment would be used to thin the stand, break up surface fuels and thinning slash, and the residual biomass would be allowed to decompose. When stands are hand thinned no slash treatment would be needed because of the low density of trees being thinned. Material would be pulled back from road ditches and fence lines.

Reforestation: In regeneration harvest units or units where openings greater than ½ acre are created, a preplant survey would be conducted to determine the required reforestation. Where planting is needed, primarily early seral tree species would be planted to increase the component of ponderosa pine and western larch as appropriate for the plant community.

Logging Systems

The following Logging Systems would be used during harvest.

- Helicopter: Helicopter logging would be used to harvest trees down to 9 inches diameter at breast height (dbh). Landings would be located on previously disturbed sites such as rock sources, wide places along the road, or old tractor landings. Construction of new landings or removal of vegetation would be minimized by locating landings where logs can be decked along roads as much as possible. Service landings would be designed to store fuel and service the aircraft. The timber sale contract requires a spill prevention plan. Ground would be disturbed to construct an earthen dike to contain any accidental spill. Trees would be fell by hand and flown to the landings. Any danger trees associated with the landings will be cut and removed.

- Skyline: An aerial logging system that brings logs to a landing using cables. Logs are totally suspended when crossing riparian areas but most often partially suspended (that is one end suspended) when taken to the landing. Since prescriptions call for partial stand removals, skyline corridors are most often parallel, about 150 feet apart, with the machine moving along the road and using the fill slope for decking.

- Cut-to Length: A cut-to-length system would be used to harvest trees down to 5 inches dbh for chipwood. Landings would be located where the forwarder route meets the road. Forwarder landings would not be constructed; logs would be decked without removing vegetation. Fuel for the equipment would be carried to the site daily. Trees are cut, manufactured into logs, and stacked along the routes by a mechanical harvester. The limbing of the trees occurs in the forwarder route to allow both machines used for harvesting and removal to operate over a slash mat. The forwarder places the logs into bunks and carries them to the landing. This is a full suspension, ground based logging system.

Table 2-3 – Proposed Harvest System and Prescriptions by Unit; F is forwarder logging; Heli is helicopter logging

Unit No.	Rx	unit acres	treatment acres	Slash Treatment	logging system
1	Improvement	60	60	mech/burn	F
4B	Improvement	20	20	mechanical	F
7	patch	75	25	mechanical	F
8C	patch	151	50	mechanical	F
10	Improvement	25	25	mech/burn	F
11A	comm. Thin	23	23	no burn	F
11B	comm. Thin	10	10	mechanical	F
12	Improvement	21	21	mechanical	F
13	Salvage	79	79	mechanical	F
14	Salvage	41	41	mechanical	F
17	comm. Thin	20	20	mechanical	F
18	comm. Thin	23	23	mech/burn	F
19	Improvement	49	49	mechanical	F
20	Improvement	72	72	mechanical	F
21	Improvement	159	159	burn	Heli/skyline
23B	Improvement	36	36	mech/burn	F
26	Improvement	92	92	mechanical	F
27	Improvement	74	74	mechanical	F
28	Improvement	27	27	mechanical	F
29	Improvement	58	58	mechanical	F

Unit No.	Rx	unit acres	treatment acres	Slash Treatment	logging system
30	Improvement	96	96	mech/burn	F
33	Improvement	97	97	mechanical	F
34	Improvement	36	36	burn	Heli/skyline
35	Improvement	89	89	burn	Heli/skyline
36	Improvement	22	22	burn	Heli/skyline
37	Improvement	120	120	burn	Heli/skyline
38	comm. Thin	65	65	burn	F
39	comm. Thin	274	274	mechanical	F
40	Improvement	57	57	burn	F
41	comm. Thin	69	69	mechanical	F
42	Improvement	35	35	burn	Heli/skyline
totals		**2075**	**1924**		

Fuel Reduction Activities

Fuel treatments would be used to prepare sites for regeneration, reduce fuel loads generated from harvest activities, reduce uncharacteristic loads of both dead and live natural fuels, or to maintain desired fuel conditions. The intent of these treatments is to break up the landscape so that wildfire could be better contained at a small size and be of low intensity to allow safe and effective suppression actions. The resulting condition would:

1. Have a combination ground and aerial fuels which would in the event of a wildfire:
    i. Produce flame lengths and rates of spread that would allow for quick and safe containment
    ii. Limit fire spread into the crowns of trees
    iii. Limit fire brands from spotting long distances
2. Provide adequate access and egress for firefighters and the public, and
3. Produce a landscape more resilient to a late summer wildfire

Treatments would be conducted in a manner to minimize topsoil disturbance and maintain woody debris for wildlife habitat at levels compatible with desired fire behavior.

Within the analysis area, the proposed fuel treatment units can be grouped into three specific areas with corresponding area specific objectives. The areas are the Andies Ridge, the Lookinglass Creek, and the Gordon/Cabin Creek area, described below.

- Andies Ridge Objective – Develop a strategic fuels break along the ridge top and lower fuel loading along Hwy 204 to ease suppression efforts and access and egress in the event of a wildfire in the Gordon Creek drainage or along the highway. Units 36, 37, 38, 39, 40, 41 and 42.
    a. Units 36 and 37 are located along State Highway 204 and include fuel treatments within the Little Phillips Creek Riparian Habitat Conservation Area. The fuel treatment would include the removal of standing and down dead trees and thinning of crowns to reduce the risk of fire moving into and through the crown. Timber harvest

would be used to remove merchantable wood followed by hand piling of fuels and burning of piles.

- Lookingglasss Creek – Develop a strategic fuels break for use in containment of fire along the north breaks of Lookingglass Creek where the favorable topography can be made more effective for controlling a wildland fire and reduce the potential need for taking suppression actions within the Lookingglass riparian area. Units 10, 11A, 11B, 12, 13, 14 17, and 35.

- Gordon/Cabin Creek - Treat individual and adjacent stands to provide opportunities and locations to contain a wildfire moving upslope along the northwest/southeast trending drainages in the project area. Units 23, 26, 27, 28, 29, 30 and 33.

Fuel Treatments

Most units have multiple fuel treatments proposed to reduce activity generated and/or natural fuels. When an understory contributes to ladder fuels, understory thinning is proposed. When mechanical treatments are proposed either mastication or grapple piling would occur depending on slash loads and the amount of fire sensitive species remaining after harvest. The method chosen would reduce the amount of times equipment passes over the ground, mastication and grapple piling would not overlap. When small diameter understory is removed for chips and there still remains a high density of understory, mastication would be used to treat both activity fuels and ladder fuels. Hand piling is also a method that would be utilized in portions of units. Two units, 120 acres, would have just the existing fuels grapple piled or masticated, removing chipwood (non sawlog material).

Table 2-4: Summary of Fuel Treatments in acres – Treatments overlap within units; there are a total of 2,075 acres proposed for treatment.

Understory Thinning	Mastication or Grapple Pile	Hand Pile	Jackpot Burn	Pile Burning	Understory Burning
1,390	1,610	250	160	1670	250

Thinning Understory: This treatment would thin understory structure to reduce ladder fuels. Fire resistant species would be favored as leave trees where they occur. Trees expected to die within 5 years would be removed, regardless of spacing. Spacing of trees in the treated stands would deter the initiation of a crown fire or the ability of a crown fire to pass through the stand. Generally, a fully stocked stand would be left. This would be accomplished by a commercial harvest.

Mastication – Live and Dead Fuels: This treatment would be comparable to a noncommercial thinning. This treatment refers to the cutting of trees ranging in diameter breast height from 1 – 5 inches. The focus of the thinning is to reduce competition, remove ladder fuels, and/or create breaks in the continuous canopy of small diameter trees. Where the species are fire sensitive, machine mastication would be used and the resulting chips would be allowed to decompose naturally. Hand felling may be used when machine access is limited by terrain or sensitive resource areas.

Piling – Grapple: This is a machine treatment that lifts fuel up and lays it in a pile. Both naturally occurring woody debris and activity generated fuels would be piled. Chain saws may be used to compact material in the pile. Pile size would vary. Pile specifications would ensure that pile burning would have minimal damage to residual trees in the stand.

Piling – Hand: Hand Piling would occur near riparian areas, steep slopes, where aesthetic values are important, or where resource values requires a low impact treatment method. Chain saws may be used to compact material in the pile and pile size would vary. Piles would be burned. Pile specifications would ensure that pile burning would have minimal damage to residual trees in the stand.

Pile Burning: Burning of piles created either mechanically or by hand piling. Burning would occur when the threat of fire spreading from the pile location would be low. A portion of the piles may be covered to aid in burning the piles in moist conditions. Piles would be lit by hand using drip torches.

Jackpot burning: Spot ignitions used to remove the heavier fuel concentrations. This burning would be conducted by hand or with the use of ATV mounted ignition devices.

Underburning: Low intensity prescribed fire would be applied to a broad area using hand ignition devices. This method would be used to favor early seral, fire resistent species composition and structure while reducing surface and ladder fuels. Under burning would be used to reduce fuels in harvest units or other areas having a need to treat natural fuels. The following activities are associated with this treatment method:

Fireline construction: Machine built fire lines are not proposed for fuel treatments.

- Blackline: Blacklines are pre-burned areas that are used as firelines in association with natural barriers or roads using hand ignitions to widen the defensible area. A blackline would also be used to reinforce a handline, when a handline is needed to control creep. Ignition is often done late in the day to take advantage of cooler night conditions and increases in relative humidity. Black lining can provide a wide fireline without the disturbance that occurs with other methods. Blackline would likely be used in Units 21A, 21B, and 35.
- Handline: Hand firelines would be used when burn conditions indicate the need to control the creep of fire in the duff. There is the potential that fall burning would require the use of more handlines than spring burning because of lower fuel moisture and the higher risk of fire creeping into unwanted areas. Burning would occur during times of rising humidity or when frontal systems pass which reduces the risk to riparian areas needing handlines. Chainsaws would be used to cut overhanging brush and large logs. The width of the line would generally be less than 18 inches.
- Ignition: the burning of piles and construction of blacklines would be done by hand ignition. No mixing or preparing of slash fuels would occur in the planning area. Slash fuel needed for hand ignitions would be mixed prior to reaching the area.

- Mop-up: Mop-up would occur when: fire creep would cause unacceptable mortality to leave trees within the unit, fire spread threatens unit boundaries, or smoke management issues arise.

Non-lethal severity is defined as more than 90 percent of the canopy cover or 70 percent of the basal area survives the burn.

Lethal (Stand-replacement) severity is less than 10 percent of the canopy cover or less than 20 percent of the basal area of the overstory vegetation remains after the fire.

- RHCAs: There would be no ignitions within RHCA's, with the exception of the RHCAs in units 36 and 37 along Highway 204, where piles will be burned. Fire would be allowed to creep into other RHCAs. Fire severity in forested RHCAs would be kept within the non-lethal severity for 90 percent or more of the affected area; and no more than 5 percent of the affected area would be in a lethal fire severity.
- Drafting: Ponds and streams would provide fall and spring water sources for fire mop-up/control needs. Draft locations would be:

3701 and 3701-015 junction, 3725-080 and 3725-098, Mottet Creek where it crosses the 6300 Road, and at Little Lookingglass Creek near the junction of the 6200 Road. See design features for a more detailed discussion of water drafting actions.

Table 2-5: Alternative B Fuels Treatments in Commercial Harvest Units

Unit	Size	Thinning	Mastication		Piling		Burning		
#	Acres	Understory	Slash	Natural Fuels	Grapple	Hand	Under	Jackpot	Pile
1	60		X	X	X				X
4B	20		X	X	X				X
7	75		X	X	X				X
8C	151		X	X	X				X
10	25		X	X	X				X
11A	23	X	X	X	X				
11B	10	X	X	X	X				X
12	21		X	X	X				X
13	79			X	X				X
14	41			X	X				X
17	20		X	X	X				X
18	23	X	X	X	X				X
19	49	X	X	X	X				X
20	72	X	X	X	X				X
21A	147						X		
21B	12						X		
23	36	X	X	X	X				X
26	92	X	X	X	X				X
27	74	X	X	X	X				X
28	27	X	X	X	X				X
29	58	X	X	X	X				X
30	96	X	X	X	X				X
33	97	X	X	X	X				X
34	36							X	
35	89	X					X		
36	22	X	X	X	X	X			X
37	120	X				X			X
38	65	X						X	X
39	274	X	X	X	X				X
40	57	X			X			X	X
41	69	X	X	X		X			X
42	35	X	X	X		X			X
	2075	Total							

Transportation and Access Management

The following table summarizes proposed road related improvements or actions that would occur under this alternative. Approximately 43 miles of roads would be used for this project. From the Access and Travel Management Plan, 23 miles are seasonally open roads, 19 miles are closed system roads, all the roads within this project area are available for winter use by snowmobiles.

Designation of System Roads in the Access and Travel Management Plan

Closed Road: These roads are not available for motorized vehicle travel for everyday access and are gated or closed by barricades. These roads can be opened for access for resource management activities or fire suppression. Snowmobile use is allowed except where specifically prohibited.
Seasonally Open Roads: These roads are available for public motorized vehicle use only during specified seasons.
Restricted Road: These are roads not maintained for passenger vehicles where use is discouraged by a physical barricade to allow only specified classes of vehicles.

Danger Tree Removal/cutting: Danger trees will be removed along the haul routes. Trees posing eminent danger to safety and those deemed likely to become a danger within a 5-10 year period will be felled along the open system. Only danger trees posing eminent threat will be felled on closed system roads. All danger trees felled in RHCAs will be left on site with the exception of those removed along Highway 204, the Little Phillips Creek RHCA in units 36 & 37. RHCAs would be evaluated for socking levels and if determined to be low for supporting/maintaining riparian functions, trees would be planted.

Temporary Road Construction: Approximately 1800 feet of temporary road will be constructed through Unit 27, in order to access Unit 28 for harvest, and reduce the need for forwarder routes within the RHCA of Gordon Creek and avoid a boggy area. The temporary road would leave FR 3725035 and follow a portion of an existing abandoned road template constructing new road to access Unit 28 along the break in slope. The first 350 feet of road as it leaves FR 3725035 is within the Gordon Creek RHCA. New construction would have minimal cut and fill and would be adequately drained. The junction with FR 3725035 would be rocked. The road would be decommissioned after fuels treatment, within 5 years. Since this road system is behind a barrier, no public use of the temporary road would develop. Decommissioning of the whole road bed would include decompaction, recontouring of any cut and fill more than 2 feet high, and revegetation with native seed.

Temporary Access: The temporary culvert placement on Road 3725038 will utilize a culvert sized to remain in place through the winter to handle Spring runoff. The culvert will be bedded and covered in clean crushed aggregate with an overflow bypass near the approach from 3725035. There will be no excavation for the culvert placement, just backfill and compaction of the clean aggregate. The culvert would be removed once haul is complete and the gravel spread on Road 3725038 between the junction with 3725035 and the stream crossing.

Road Maintenance: Road maintenance is needed to protect water quality and aquatic resources, to meet access needs, and to provide safe and efficient road operations. Road maintenance consists of a variety of activity components including surface rock replacement, spot surfacing, roadside brushing, erosion control, logging out, road surface blading, ditch cleanout, slide removal, dust abatement, culvert cleaning or replacement, hazard tree removal, and other items that contribute to the preservation of the existing road and its safe use. Dust abatement will be accomplished by water only, on account of limited volumes to be hauled on roads with mixed used. Snow plowing would be allowed for activities outside the winter recreation season, December 1 to March 31. Surface rock replacement includes FR 3725035 from the junction of FR 3725 to the junction of FR 3727041

Material Sources: T3N, R39E, S5, SW of NE north of the junction of FR 6306 and FR 6306060, T3N, R39E, S31, NE of SW along FR 3725093. Both of these sources are existing and will not need any further expansion.

Water Sources: Little Lookingglass Creek at FR 63, Mottet Cr. at FR 63, Jubilee Lake, North Fork Umatilla River at OR 204

Table 2-6: Transportation Activity Summary for Alt B

Activity	Amount
Temporary Road Construction	0.34 miles
Maintenance:	
Standard Maintenance	42.5 miles
Surface rock replacement	13.9 miles
Heavy brushing	24.9 miles
Rock Sources	2
Water Sources	4
Gated System Roads needing to be opened	19.03 miles

ALTERNATIVE C Fuel Treatments with Additional Focus on Highway 204

This alternative would further modify Alternative B. Several proposed units were reduced in size because of changes in prescriptions. It was also decided to take a more indepth look at the Highway 204 corridor for fuel reduction and hazard tree removal. With the exception of the modifications listed below, this alternative is the same as Alternative B.

- Unit 4B has been dropped in order to retain large tree habitat for wildlife.
- Unit 8C has reduced in size and had its prescription changed from a 'patch cut' to an 'improvement cut'. The unit did not lend itself to patch cuts. The silvicultural objective is to thin grand fir in favor of the early seral species western larch. The unit is now 50 acres in size.
- Unit 17 prescription changed from 'commercial thinning' to an 'improvement cut'.
- Unit 39 is now 82 acres. Upon further field inspection it was deemed that the eastern portion of the unit's fuel loads do not need treatment at this time. This leaves the western portion of the unit and fewer acres.
- Unit 42 has increased in size to 489 acres and now includes the eastside of the Hwy. 204 corridor. In response to scoping comments requesting that the project be reevaluated for more possible treatment acres, the IDT identified the need to treat fuels and danger trees along the eastern side of the Highway 204 corridor.
- RHCA along Hwy. 204 corridor will receive fuels and danger tree removal.
    - Silvicultural treatments to reduce crown density in the RHCA of Little Phillips Creek would only occur along sections of the units where Little Phillips Creek is located on the opposite side (westside) of Hwy. 204, away from the activity units (36, 37 & 42).
    - Where Little Phillips Creek is between the road and the unit, only danger trees will be cut in the RHCA. Danger trees would be felled and left in portions of streams where large wood can safely be left and not risk damage to the road or traffic. Danger trees not needed for large wood would be removed as part of fuel reduction objectives. Trees or pieces of trees between the highway and the stream would be removed where they pose a

danger for vehicle collisions. Natural and activity generated surface fuels inside the RHCA would be hand piled and burned. See also Design Features for Fisheries.

The same Forest Plan Amendment needed to allow timber harvest in the Little Phillips Creek RHCA described for Alternative B would be needed here.

Table 2-7: Summary of Proposed Treatments

Treatment Activity	Acres of Harvest	Estimated Volume
Commercial Harvest		
Helicopter/Skyline	915	2,650,000 bf Saw Log
Cut-to-length	1251	3,360,000 bf Saw Log
Total Commercial Harvest	2166	6,010,000 bf Saw Log
Other Activities		
Pre-commercial Thinning	795	
Total For Proposed Action	2961	

Timber Harvest

This alternative would use all the silvicutural prescriptions described in Alternative B. Only unit prescriptions and sizes have changed between alternatives.

Table 2-8: Summary of Proposed Stand Prescriptions for Alternative C

Treatments	Number of Units	Unit Acres	Treatment Acres	Volume, mbf
Improvement Cut	20	1652	1652	4,976
Commercial Thinning	7	369	369	787
Patch Cuts	1	75	25	125
Salvage	2	120	120	120
Subtotal	30	2216	2166	6008
Non-commercial thinning	34	795	795	na
Total	64	3011	2961	6008

Logging Systems

Same types of logging systems proposed in Alternative B will be used in Alternative C. The amount of acres change and is summarized in Table 2-7 and listed for each unit in Table 2-9.

Table 2-9: Proposed Harvest System and Prescriptions by Unit; F is forwarder logging; Heli is helicopter logging

Unit No.	Rx	unit acres	treatment acres	Slash Treatment	logging system
1	Improvement	60	60	mech/burn	F

Unit No.	Rx	unit acres	treatment acres	Slash Treatment	logging system
7	patch	75	25	mechanical	F
8C	improvement	50	50	mechanical	F
10	Improvement	25	25	mech/burn	F
11A	comm. Thin	23	23	no burn	F
11B	comm. Thin	10	10	mechanical	F
12	Improvement	21	21	mechanical	F
13	Salvage	79	79	Mechanical	F
14	Salvage	41	41	Pile burn	F
17	Improvement	20	20	mechanical	F
18	comm. Thin	23	23	mech/burn	F
19	Improvement	49	49	mechanical	F
20	Improvement	72	72	mechanical	F
21	Improvement	159	159	burn	Heli/skyline
23B	Improvement	36	36	mech/burn	F
26	Improvement	92	92	mechanical	F
27	Improvement	74	74	mechanical	F
28	Improvement	27	27	mechanical	F
29	Improvement	58	58	mechanical	F
30	Improvement	96	96	mech/burn	F
33	Comm. Thin	97	97	mechanical	F
34	Improvement	36	36	burn	Heli/skyline
35	Improvement	89	89	burn	Heli/skyline
36	Improvement	22	22	burn	Heli/skyline
37	Improvement	120	120	burn	Heli/skyline
38	comm. Thin	65	65	burn	F
39	comm. Thin	82	82	mechanical	F
40	Improvement	57	57	burn	F
41	comm. Thin	69	69	mechanical	F
42	Improvement	489	489	burn	Heli/skyline
Total		**2216**	**2166**		

Fuels Reduction Activities:

The same types of fuel treatments described in Alternative B will be used here. Table 2-10 summarizes the proposed fuel treatments.

Table 2-10: Summary of Fuel Treatments in acres – Treatments overlap within units; there are a total of 2,216 acres proposed for treatment.

Understory Thinning	Mastication or Grapple Pile	Hand Pile	Jackpot Burn	Pile Burning	Understory Burning	Yarding with Tops Attached and YUM yarding
1,650	1,750	700	160	1910	250	489

The fuel treatments proposed along Highway 204 are to reduce or maintain fuel conditions that would support safe suppression actions taken on Andies Ridge or for initial attack along Highway 204. Fire behavior and fuel character should be such that increases the success of keeping a fire from moving into the Palmer Valley WUI. Unit 42 is proposed for whole tree removal and YUM yarding because broadcast burning at a landscape scale above the highway would pose a traffic safety concern because of smoke. The fuels and slash adjacent to the highway would be hand piled and burned. Large wood would be left for wildlife needs.

Yarding with Tops Attached and YUM: This treatment removes most, but not all, the small and fine fuels when logs are manufactured. The tree is limbed and cut into logs with the top limbs remaining attached and removed at the landing. This treatment method reduces the amount of fine fuels left after harvest. YUM is Yard Unutilizable Material and is used to reduce the amount of large dead down fuels in the unit. This material is piled or decked for later burning. If the decks provide firewood quality material, the decked material on FR 3727020 could be offered to a commercial wood cutter or to the public for person use firewood.

Table 2-11: Alternative C Fuels Treatments

Unit	Size	Yarding with tops attached YUM	Thinning	Mastication		Piling		Burning		
#	Acres		Understory	Slash	Natural Fuels	Grapple	Hand	Under	Jackpot	Pile
1	60			X	X	X				X
7	75			X	X	X				X
8C	50			X	X	X				X
10	25			X	X	X				X
11A	23		X	X	X	X				
11B	10		X	X	X	X				X
12	21			X	X	X				X
13	79				X	X				X
14	41				X	X				X
17	20			X	X	X				X
18	23		X	X	X	X				X
19	49		X	X	X	X				X
20	72		X	X	X	X				X
21A	147							X		
21B	12							X		
23	36		X	X	X	X				X
26	92		X	X	X	X				X
27	74		X	X	X	X				X
28	27		X	X	X	X				X
29	58		X	X	X	X				X
30	96		X	X	X	X				X
33	97		X	X	X	X				X
34	36								X	
35	89		X					X		
36	22		X	X	X	X	X			X
37	120	X	X				X			X
38	65		X						X	X

Unit #	Size Acres	Yarding with tops attached YUM	Thinning Understory	Mastication Slash	Mastication Natural Fuels	Piling Grapple	Piling Hand	Burning Under	Burning Jackpot	Burning Pile
39	82		X	X	X	X				X
40	57		X			X			X	X
41	69		X	X	X		X			X
42	489	X	X	X	X		X			X
	2216	Total Acres								

Transportation System and Access Management:

The following table summarizes proposed road related improvements or actions that would occur under this alternative. The description of the activity is found in Alternative B.

Table 2-12: Summary of Transportation Activities

Activity	**Amount**
Temporary Road Construction	0.34 miles
Maintenance:	
Standard Maintenance	41 miles
Surface rock replacement	13.9 miles
Heavy brushing	23.4 miles
Rock Sources	2
Water Sources	4
Gated System Roads needing to be opened	17.2 miles

ALTERNATIVE D- Fuels Focus

In this action alternative, only units with a primary focus towards fuel reductions would be treated. All other units, those focusing on stand density and structure, were dropped. Since this alternative also focuses treatment along Highway 204 it is a modification of Alternative C as described below:

- No harvest entry would be made into the PACFISH defined RHCA of Little Phillips Creek. Danger trees would be cut and left within the RHCA. Trees or pieces of trees adjacent to the highway would be removed where they pose a danger for vehicle collisions.
- The removal of the RHCA for harvest options from Unit 36 reduced it to 4.8 acres. This unit would be combined with Unit 37. Unit 37 became 96 acres after being reduced for the RHCA along Little Phillips Creek and adding the few acres left from Unit 36.
- No temporary road construction would be needed.

Table 2-13: Summary of Proposed Treatments

Treatment Activity	Acres of Harvest	Estimated Volume
Commercial Harvest		
Helicopter/Skyline	730	2,100,000 bf Saw Log
Cut-to-length	465	800,000 bf Saw Log
Total Commercial Harvest	1195	2,900,000 bf Saw Log
Other Activities		
Pre-commercial Thinning	795	
Total For Proposed Action	1,990	

Timber Harvest

Silvicultural prescriptions are defined in Alternative B. Prescriptions were developed to provide stand structure and composition for effective suppression and fire control actions, including thinning of overstory crowns to reduce the risk of crown fires.

Table 2-14: Summary of Proposed Stand Prescriptions for Alternative D

Treatments	Number of Units	Unit Acres	Treatment Acres	Volume
Improvement Cut	7	859	859	3108
Commercial Thinning	3	216	216	216
Patch Cuts	0	0	0	0
Salvage	2	120	120	120
Subtotal	12	1195	1195	3444
Non-commercial thinning	34	795	795	na
Total	46	1990	1991	3444

Logging Systems

The same types of logging systems defined in Alternative B would be used in Alternative D. The amount of acres is different and is summarized in Table 2-13 and listed for each unit in Table 2-15.

Table 2-15: Proposed Harvest System and Prescriptions by Unit; F is forwarder logging; Heli is helicopter logging

Unit No.	Rx	unit acres	treatment acres	Slash Treatment	log syst
13	Salvage	79	79	Mech	F
14	Salvage	41	41	Pile burn	F
20	Improvement	72	72	Mech	F
21	Improvement	159	159	Burn	Heli/skyline
34	Improvement	36	36	Burn	Heli/skyline
35	Improvement	89	89	Burn	Heli/skyline
37	Improvement	96	96	Burn	Heli/skyline

Unit No.	Rx	unit acres	treatment acres	Slash Treatment	log syst
38	Comm. Thin	65	65	Burn	F
39	Comm. Thin	82	82	Mech	F
40	Improvement	57	57	Burn	F
41	Comm. Thin	69	69	Mech	F
42	Improvement	350	350	Burn	Heli/skyline
Total		**1195**	**1195**		

Fuels Treatments

The same types of fuel treatments described in Alternative B and C would be used in Alterative C. Table 2-10 summarizes the proposed fuel treatments.

Table 2-16: Summary of Fuel Treatments in acres – Treatments overlap within units; there are a total of 1,195 acres proposed for treatment.

Understory Thinning	Mastication or Grapple Pile	Hand Pile	Jackpot Burn	Pile Burning	Understory Burning	Yarding with tops Attached and YUM yarding
880	750	150	160	465	250	350

In addition to the treatments in the table approximately 185 acres of fuels would be hand piled and burned to deal with fuels generated by the danger tree cutting and leaving along Highway 204.

Table 2-17: Proposed fuels treatments by unit for Alternative D

Unit #	Size Acres	Yarding with tops attached YUM	Thinning	Mastication		Piling		Burning		
			Understory	Slash	Natural Fuels	Grapple	Hand	Under	Jackpot	Pile
13	79				X	X				X
14	41				X	X				X
20	72		X	X	X	X				X
21A	147							X		
21B	12							X		
34	36								X	
35	89		X					X		
37	96	X	X				X			X
38	65		X						X	X
39	82		X	X	X	X	X			X
40	57		X			X			X	X
41	69		X	X	X		X			X
42	350	X	X	X	X		X			X
	1195	Total Acres								

Transportation Systems and Access Management

To accomplish the proposed timber harvest, fuel reduction, and stand improvement approximately 23 miles of roads would be used. From the Access and Travel Management Plan, 11 miles are seasonally open roads, 12 miles are closed system roads.

There would be no temporary road construction or the need for the temporary culvert.

Table 2-18: Summary of Transportation Activities

Activity	Amount
Temporary Road Construction	N/A
Maintenance:	
Standard Maintenance	22.3 miles
Surface rock replacement	6.5 miles
Heavy brushing	15.3 miles
Rock Sources	2
Water Sources	4
Gated System Roads needing to be opened	11.1 miles

Project Design Features Common to all Alternatives B, C, and D

Fish and Water Quality

- Protect PACFISH Riparian Habitat Conservation Areas, See Appendix E. Except for Little Phillips Creek, keep harvest and associated landings outside of RHCAs and conduct forwarding away from RHCAs. If trees within RHCAs need to be cut for safety reasons, they would be left as downed wood.
- Forwarder trails crossing the draw bottoms would be at approved locations.
- Retain downed wood in ephemeral draws, as detailed in Appendix E.
- Use existing trail system as much as possible. Ground-based equipment would operate when the soil conditions are well drained.
- Minimize exposure of soils and, erosion and sediment transport. Stabilize landing approaches with slash, bark, or native seed. Extensive areas of exposed soil, those greater than 100 square feet, caused from landing activities or from the logging operations or mechanical fuel treatments would be revegetated with native plants or covered with mulch.
- Skyline Yarding: Where possible, logs will be fully suspended when crossing RHCAs. Skyline corridors will have erosion control measures including water bars. If logs cross RHCAs with one end suspension, water bars or other erosion control methods will be used to reduce direct input of sediment into channels.
- For protection of fisheries in Little Phillips Creek and Highway 204 the following design features would be used to minimize impacts to fish and fisheries habitat:
    - When cutting danger trees either in the channel or when the channel is between the road and the harvest unit, adjust the timing of work in the RHCA of Little Phillips Creek to reduce effects to fish in the stream. This will be accomplished by either: a) working early in the season while streamflow is high enough to allow fish to easily move away from project work sites, or b) work while the stream channel is dry. This timing

adjustment is likely to require instream work outside of the normal in-stream work window when trees are being left and positioned in the channel or are being removed from the channel.

- Coordinate with the Oregon Department of Transportation for places where large wood can be felled and left in the stream and how the large wood should be placed. There are places in the upper reaches where the stream is distant to the highway or far enough below the highway that would allow large wood to be retained without posing a risk to the highway or culverts. Pieces of wood being left must be of a size and length that will be stable in the channel and not wash away under normal flows. Trees that will not become large wood for the stream, will be directionally felled away from the stream.
- Trees that fall into the channel will be removed or repositioned if they pose a threat to undercutting the highway. When removing trees from the channel, it should be done in such a way to reduce sediment inputs into the stream. Lifting the log out is preferred.
- Pile and burn harvest generated slash and natural fuels 25 feet or farther from the stream channel.
- Burning of piles should not create areas larger than 100 square feet of exposed soil; seed any exposed areas with native seed and/or cover with weed free mulch.

Water Quality Best Management Practices: see also Appendix E

- Within RHCAs, no wood embedded in soil will be removed during fuels treatments. Alternatives B, C, and D
- FR 3725035 will be spot rocked prior to use, from the junction with FR3725 to the junction of Road 3727041
- The temporary road accessing Unit 27 and 28 will be rocked at the junction with FR 3725035
- Temporary culvert on FR 3725038 will be sized to pass winter flows. Fill used to install this temporary culvert will consist of clean gravel.
- Erosion control will be kept current on skyline corridors used to remove logs from Little Phillips Creek RHCA
- Hand-piles in the Little Phillips Creek RHCA, Units 36, 37, and 42 will be located as far as practicable from the channel.

Wildlife

- Protect goshawk nests from disturbance if any are located during project activities. No nest sites are currently identified. Defer harvest on 30 acres of the most suitable nesting habitat around nest sites. Retain late and old structure forest in a 400-acre post-fledging area (PFA) as determined by the district biologist. Defer activities in active PFAs from April through August.
- Protect other known or discovered raptor nest sites from management activities and human disturbances until fledging has been completed. Levels of protection will vary by the requirements of the species involved.
- If jack strawed logs or blown down trees occur in units, retain two piles per each 5 acres to provide denning habitat.
- Dead trees larger than 21 inches will be retained in Units 13, 14, and 20
- Maintain dead wood habitat and green replacement trees at or beyond levels identified in the table below. Leaving additional snags is highly desirable. All snags retained will be greater than

20-inch diameter at breast height, but if there are not enough snags of this size, all large snags will be left and some smaller snags will be retained to make up the difference. Tree species and soundness at the base will also be considered. The tree species most preferred are ponderosa pine, western larch, and Douglas-fir. In addition, where safety allows, hollow or partially hollow, broken top snags greater than 15 inches diameter at breast height will be left to provide roost habitat for bats. Dead grand fir most commonly provides hollow tree habitat.

Table 3. Snag and down wood retention per acre by plant association group.

	Dry Upland Forest	**Moist Upland Forest**
Snags > 20 in dbh (per acre)	3	3
Green Tree Replacements (per acre)	23	16
Down Wood Pieces (per acre)	3 – 6	15 - 20
Diameter at the small end	$\geq$ 12 in	$\geq$ 12 in
Length per piece	> 6 feet	> 20 feet
Total length per acre	> 20 feet	> 100 feet

Sensitive Plants

- Measure to protect *Carex crawfordii* and *Carex interior*: avoid piling excess fuels and burning piles in perennially wet areas, riparian/riverine habitats, or where surface water is present for the majority of the growing season. Stream banks, perennially west areas, and riparian/riverine areas should be excluded from potentially hot, localized ground fires related to burning piles or understory burning. No ground disturbing activities (skidding, decking, parking equipment, masticating) should occur in any area that has water at least 10 months of the year.

Invasive Plants Prevention Plan

The following prevention measures will be taken in compliance with the Forest Plan amendment directed by the Regional Forester in the ROD for *Pacific Northwest Region Invasive Plant Program Preventing and Managing Invasive Plants*. These measures are in addition to those listed in the Umatilla National Forest Noxious Weed EA, 1995, and are a summary of those proposed in the Noxious Weed Report.

Use of Equipment

- Clean equipment for logging, slash masticating, and road construction prior to moving onto the Forest. This includes ATVs used to access the area. Approve the use of on-Forest cleaning sites in advance.

- Keep skidding, felling, masticating, and road construction equipment clean of invasive plant seed when moving between units. This can be accomplished by various methods such as washing equipment prior to leaving a invasive plant site, moving equipment through a site prior to seed formation, taking alternate routes around infestations or removal of seed heads or plants prior to moving.

Roads and Road Maintenance

- Pit/Quarry plans will consider invasive plants in the development of long-term plans and will develop plans to prevent introduction or to prevent the spread of existing infestations. Rock and water sources will be reviewed for invasive plants and treated by hand methods, or other approved methods, prior to use. Avoid spreading rock that has been contaminated with invasive plant seeds; the district invasive plant specialist will be consulted to determine the suitability of the rock.
- Conduct road blading, brushing, and ditch cleaning in areas with high concentrations of invasive plants in consultation with the District invasive plant specialist.
- Maintain ground cover wherever possible to prevent infestations from developing or expanding.
- Maintain a vigorous herbaceous cover along the edges of roads to reduce the risk of invasive plant infestations. Consider reseeding closed roads that are used for access.
- Where practicable, maintain tree cover along roads. Shading reduces the incidence of new knapweed sites.
- In areas of high invasive plant infestations, consider closing roads temporarily to reduce enlargement of sites. This would be done with public input if the planned treatments are not effective because of vehicle travel.

Ground Disturbance and Control of Spread

- Where existing inventories or pre-project inventories indicate that an infestation occurs on or near a ground disturbing project, the project will be designed, in coordination with the District Invasive Plants coordinator, to plan for the long term management and monitoring of the infestation and to prevent the spread of the infestation off site.
- Avoid parking vehicles and equipment in invasive plant sites.
- Map invasive plant sites to be controlled in the planning area. Provide the map to purchasers and contractors. An identification review of specific weed(s) may be necessary for the purchasers or contractors to comply with the implementation procedures.
- Project level personnel, including contractors, will be assisted in learning to recognize invasive plants occurring or adjacent to the project area.
- Avoid exposing mineral soil adjacent to weed sites, to minimize their enlargement.

Cover and Revegetation

- Use weed-free straw and mulch.
- Reseed areas where soil is displaced for landings, temporary roads, fuel treatments, or road obliteration. Use certified weed-free, non-persistent seed, preferably native grass seed if available. Consider fertilizing as part of reseeding plans if a combination of seeding and fertilization would decrease the incidence of weeds.

Monitoring

- Monitor proposed temporary roads, landings and other sites of ground disturbance or canopy reduction for new infestations of invasive plants. Treat newly identified sites as soon as practicable; time treatment to be most effective. Schedule several treatments, if necessary to

control the infestation. After the final treatment, develop a site specific reseeding plan for fully occupying the site with desired grass, forb or shrub species. Consider fertilizing and burning as part of the reseeding plan if these measures would decrease the incidence of weeds.

- Sites that have been treated by manual methods will be surveyed yearly for invasive plants as well as the roads that could be infested by the harvest activity or recreation use. At the end of five years the monitoring would be adjusted according to the results of the surveys.
- Harvest units and fuel treatment areas would be surveyed the first year after harvest and fuel treatment, the third year, and the fifth year to determine the presence of invasive plants and if the post harvest crown closure has effective in reducing the risk to spread of weeds in combination with the reduced exposed soil from the logging system. These exams can be done in conjunction with stand and stocking surveys.
- In addition, all other Forest Roads used for travel will be surveyed for invasive plants the first and third year after harvest. If sites appear after the third year, additional monitoring would be needed.
- Survey techniques and methods will be developed to evaluate and identify where the proposed landscape prescribed fire has created moderate to large acres of exposed soil. These sites would be random across the planned burn area and more difficult to identify. However, areas for priority monitoring would be burned areas adjacent to or near known invasive plant species that are rated high for treatment.

Visual Quality

- When developing harvest prescriptions review the standards and guidelines for Management Area A3. When improvement harvest prescriptions indicate a group selection may occur, control the amount and size of created openings such that they are not larger than 2 acres and range between 8 to 20 percent of the area, depending on visual quality objectives.
- When cutting trees in Forest Plan Management Area A3, use low stumps in foreground areas to the highway.

General Control of Harvest

- Evaluate landings for subsoiling and schedule if needed. Subsoiling would reduce compaction and break up the bark left behind after log haul.
- Schedule harvest activities so that conflicts with grazing do not occur.
- Treat grand fir and subalpine fir stumps with borax to reduce the risk of root disease spreading to the remaining trees.
- Protect cultural/historic sites by avoiding them. There are two cultural sites in harvest units included in the Modified Proposed Alternative, and one site adjacent to a road.

Soils Protection

- Forwarder Units 27 and 29 and Helicopter Units 21, 34, 35, 36, and 37 are located on soils with a high risk to surface erosion. Logging and fuel treatments will be conducted to retain soil cover and duff such that displacement can be confined and not expose long slopes to rilling.
- All Forwarder units have soils with a high risk to puddling and/or compaction. To protect these soils from extensive compaction, equipment use low ground pressure equipment, reuse existing disturbed areas, and avoid wet soil conditions. Review these units after harvest or mechanical fuel treatments to determine the need for subsoiling.

Protection of Residual Trees

- Protect desirable advanced regeneration and mature trees in the residual stand of all harvest and fuel treatment units.

Reforestation/Tree Planting

- No fertilizers will be used in tree planting or other post-harvest reforestation; also see the Invasive Plant Prevention Plan.

Prescribed fire

- In the unlikely event of prescribed fire exposing sufficient bare soil near to stream channels causing measurable amounts of sediment to reach fish habitat, implement erosion control or sediment detention measures (i.e. straw wattles or straw mulch) and revegetate with native vegetation.
- Ignitions are permitted to the outer edges of RHCAs; see Appendix E for RHCA widths. Prescribed fire would be allowed to back into RHCAs.
- Mop-up/suppression activities would be conducted for fires that cause mortality of trees at unacceptable levels. Within RHCAs, suppression activities would be triggered when 5 percent or less of the area is approaching 10 percent mortality of the canopy cover.
- Construct blackline needed for control of prescribed fires no closer than the outer edge of RHCAs. No initial blackline or hand firelines needed for controlling the prescibed fire will be constructed in the RHCAs.
- Retain as much duff as possible, while meeting fuel reduction objectives. Duff coverage helps control erosion and provides organic matter.
- Store fuel for the helicopter off site; deliver fuel via truck the day of the burn. Locate landings at existing rock sources or other disturbed areas.
- Locate helispots in disturbed areas outside of RHCAs
- Drafting of Water: See description under "Road Maintenance."
- Wetting agents including detergents, soaps, and surfactants may be mixed with water for suppression activities, but will not be mixed or used near surface water and will be applied by hand for maximum control. Containers will not be filled or cleaned in streams.
- With jackpot or underburning, limit soil exposure to 20 percent or less of the area and time ignitions to reduce the risk of mortality to large trees.
- Review invasive plant prevention plan for applicable measures. Choose helispots and parking areas that do not have invasive plants.
- Schedule fuel treatments such that conflicts with grazing do not occur.

Road Maintenance

- Use the State of Oregon in-stream work window to replace culverts in stream channels with perennial flows. Exact dates may vary by stream and by fish use.
- See the Invasive Plants Prevention Plan for additional guidance.
- Maintain mid-slope roads crossing RHCAs using methods that reduce sediment into stream channels. Use surface hardening, by water or rocking, when crossing RHCAs. Drain the road

surface prior to entering RHCAs when drainage water can be spread overland and filtered prior to reaching channels.

- Specific protective measures for Water Drafting are as follows:
  - During drafting, sources will be monitored for reduced flows. When and if low flow (less than 5 cfs) conditions are identified, spring-fed ponds will be used as sources prior to the use of stream sources whenever feasible. When spring feed ponds are not feasible stream sources can be used but pumping rates must not reduce flows to less than 5 cfs. If the stream has less than 10 cfs, stream flow cannot be reduced more than 1/10th of the existing stream flow and will discontinue drafting if this amount is exceeded. Flow in Mottet Creek gets very low during mid summer and will not be available for use nor will its tributaries.
  - When drafting from Lookingglass, Little Lookinglass or Mottett Creeks, NOAA approved screens would be used over drafting hose intakes to prevent entrapment of ESA listed fish.

- Specific protective measures for road surface shaping, blading, and rocking are as follows:
  - Side casting of materials would not occur where those materials could be directly or indirectly introduced into a stream, or where the placement of these materials would contribute to the destabilization of the slope.
  - Blading, shaping and aggregate placement should be performed in spring and early summer when stream flows are high to take advantage of available road soil moisture content minimizing the need for water drafting. Exceptions during the low-flow period would be limited to roads receiving heavy summer through fall traffic creating hazardous road surface conditions that require maintenance for traffic safety reasons.
  - Undercutting of cut slopes would be avoided during maintenance activities.
  - Slough and waste materials removed during maintenance activities, including ditch and culvert cleaning, will be deposited in approved disposal areas outside of RHCAs. For erosion control and stabilization the disposal site will be seeded with native seed.
  - Grader operators would backblade away from areas adjacent to streams where there is a potential for sediment delivery into streams.
  - Sediment control devices would be placed to trap sediment in specific areas where sediment could reach a stream.
  - Grassy areas would be maintained around ditch relief culverts to minimize the potential for sediment delivery to streams from road grading.
  - Temporarily constructed roads would be decommissioned, blocked, and revegetated with native seed upon project completion for each individual harvest unit.

- Brushing in drainage ditches ensures that water is not diverted out of the ditch. Brushing in drainage ditches can include complete removal of vegetation in the roadways as well as removing limbs from vegetation that may extend into the road. Specific protective measures for roadside brushing are as follows:
  - Brush removal would occur within RHCAs only where safety is an issue. Options other than complete "removal" would be considered in order to leave ground cover to help control water and sediment flow off the road surface into the RHCA and stream channels as well as provide stream shade.
  - Debris from brushing operations would be scattered or chipped in areas where it would provide sediment control and/or other ecological benefits.
  - When masticating equipment is used to remove brush at stream crossings would be used in such a way as to not cause ground disturbance to prevent sediment delivery to a live stream. Brush and other standing vegetation that provides shade to streams would be maintained except where public safety is an issue.

- Roadside brushing that involves more than minimal removal of vegetation (*i.e.*, limbing of trees or removal of brush) in RHCAs would be reviewed by a Umatilla NF fish biologist.

- Snow removal equipment would be of the size and type commonly used to remove snow, would not cause damage to the road, would be equipped with shoes or runners, and would leave a layer of snow one to two inches thick on the roadway. Snowplowing may occur inside RHCAs, but snow would not be sidecast directly into streams. Sidecasting in areas adjacent to streams where there is the potential to cause snow or ice damming would be avoided.
- When operating in RHCAs, all heavy equipment or other machinery would be inspected for hydraulic or other leaks. Leaking or faulty equipment would not be used. Equipment with accumulations of oil, grease, or other toxic material would be cleaned in pre-approved sites outside of RHCAs.

COMPARISON OF ALTERNATIVES

This section describes the differences between alternatives with regard to the Purpose and Need and the Key Issues described in Chapter 1.

Table 2-19. Activities for each Alternative

Activities	Alternatives			
	A	B	C	D
Total Harvest Volume (mbf)	0	5,060	6,010	2,900
Total Harvest (gross acres)	0	2,075	2,216	1,195
Total Harvest (net acres)	0	1,924	2,166	1,195
Commercial Thin – acres	0	484	272	216
Improvement cut – acres	0	1,245	1,749	859
Salvage- acres	0	120	120	120
Patch cut – acres	0	75	25	0
Total Fuel Treatments (acres)	0	2,075	2,216	1,195
Mechanical fuel treatment (acres)	0	1,610	1,750	750
Maintenance (miles)	0	42.5	41	22.3
Temporary road construction (miles)	0	0.34	0.34	0
Closed road opened temporarily (miles)	0	19.03	17.2	11.1
surface rock Replacement (miles)	0	13.9	13.9	6.5
Road brushing (miles)	0	24.9	23.4	15.3
Culverts replaced (number)	0	0	0	0
Temporary Culverts to open roads (number)	0	1	1	0

Purpose and Need for Action

The following tables compares alternatives using measures and outputs that are used to indicate Purpose and Need attainment.

Table 2-20. Comparison of Purpose and Need by Alternative (Acres)

Purpose and Need Chapter 1 page 5	A	B	C	D
1. Modify the intensity and resulting fire behavior to that characterized by Fuel Model 8 … Measured by the number of acres that would have fuels reduced by removing ladder fuels, reducing interlocking crowns, and removing fire intolerant species.	0	1,117	1,379	1,196
Increase resilience of stands to disturbance from insect, disease, or wildland fire. Measured by the number of acres that would be treated to reduce stand density and encourage disease resistant species.	0	956	832	0
Improve stand conditions where they are dominated by western larch. Measured by the number of acres that will be treated to encourage western larch regeneration.	0	953	850	463
Provide "bio-mass" products for utilization by local industry. Measured by the number of acres with biomass removal	0	2,073	2,211	1,196
Improve public safety through the removal of danger trees. Measure by the number of miles proposed for danger tree removal/cutting.	0	43.8 (1.3 on Hwy 204)	46.2 (5.2 on Hwy 204)	27.4 (5.2 on Hwy 204)

<u>Significant Issue 1</u>: *Fuel treatments within the Little Phillips Riparian Habitat Conservation Areas (RHCAs)*

Table 2-21: Comparison of treatments occurring in the Little Phillips Creek RHCA

Type of Treatment	Alt A	Alt B	Alt C	Alt D
Miles of Danger Tree Removal/cutting along Highway 204	0	1.3	5.2	5.2
Acres Cutting and Removal of Danger Trees; < 5 % reduction in crown closure	0		15	
Acres Cutting and leaving of Danger Trees; < 5 % reduction in crown closure				92
Acres of Surface Fuel Reduction		45	184	184
Acres of Stocking level Treatments, includes danger trees; 15 % reduction in crown closure		45	153	0
Acres of treatment in Perennial Portion of Little Phillips Creek.		31	15	15

Significant Issue 2: Retention of canopy cover for wildlife and suppression of future ladder fuels.

Table 2-22: Comparison of alternatives for changes in Wildlife habitat

	Alt A	**Alt B**	**Alt C**	**Alt D**
E2 Habitat Effectiveness Index (HEI)	58	57	57	58
Percent of E2 in Satisfactory Cover	13	10	10	12
Percent of E2 in Total Cover	52	46	48	51
E2 Habitat Effectiveness Index (HEI)	66	66	66	66
Percent of C4 in Satisfactory Cover	17	17	17	17
Percent of C4 in Total Cover	65	63	63	63
Acres of stem exclusion being treated	0	1,497	1,759	1,043
Treatments in Stem Exclusion as a Percent of Total Proposed Treatment	0	78	81	87

Chapter 3 - Environmental Consequences

This section summarizes the existing environmental conditions followed by a disclosure of effects for each alternative. Impacts to resources of concern raised during scoping will be tracked under the single resource that generated it. This chapter will present the more detail scientific and analytical analysis that generated the comparison of alternatives in Chapter 2.

Effects can be direct (occurring at the same time and place as the action), indirect (separate in time from the action that caused them), or cumulative (the incremental effect of the project added to the effects from other past, present, and reasonably foreseeable actions). Effects from past actions have been captured in describing the current condition. Impacts associated with past timber harvest, the road system, grazing, and recreation all affect the current environmental condition. As an example, past timber harvest is reflected in the current vegetation and contributes to the description of big game cover and HEI, successional stages used in Historic Range of Variability analysis, the hydrologic condition expressed as equivalent treatment areas, and soil conditions.

Past Actions

Past actions include timber harvest with slash treatments along with minor amounts of prescribed fire in the Balloon Tree area. Since the residual effects of these actions are included in describing the existing condition and were used in developing the proposed action and alternatives, listing them provides little meaning to the analysis. Past actions are maintained as a layer in the District GIS database and have been used for describing the existing soil, hydrologic, and big game conditions. These layers are also used to assure consistency with Forest Plan standards and guidelines for visuals and detrimental soil conditions among others.

Current activities within the Planning Area include:

- Summer open roads and dispersed camping
- A portion of the North End Sheep and Goat Allotment,
- Lugar Springs campground within the Planning Area and Woodland and Jubilee Lake Campgrounds near the Planning Area.
- ATV trail system on the roads within the Lugar Springs portion of the Planning Area
- The Lookingglass Motorized Trail; a motorcycle trail from Spout Springs to Lugar Springs.
- Snowmobile trails in the Balloon Tree portion of the Planning Area
- Non-commercial thinning

Reasonable Foreseeable Future Projects

- Reconstruction of FR 6400 to adjust the road template to be a full width double lane road and surface rock replacement. This is just outside the Planning Area but is within the Lookingglass watershed.
- The Renewal of the North End Sheep and Goat Allotment
- Use on Private lands: Existing uses on private land are expected to continue. Currently most of the private lands adjacent to the planning area are timber lands that have been harvested in the past five years.
- Construction of a series of short trail segments to link the restricted roads west of FR 63 to develop a loop trail opportunity for ATVs in the area.
- Improvement and Restoration Projects listed in Chapter II.

Impacts to Forest Resources

Fire and Fuels

The following is a summary of the analysis found in the fuels specialist report for the Loon Fuels Reduction Project and supplemented with additional information in the EA. The report can be found in the Project Analysis File.

Existing Fuels Condition

General background: Wildfire behavior is influenced by weather, topography, and fuels. Prevailing winds are from the west and the southwest. Topography effects local weather conditions, as daytime heating and nighttime cooling sets up definitive diurnal airflow patterns that results in afternoon upslope/up canyon winds. From 1970 to 2006, 55 fires have occurred in the Planning Area, burning a total of 226.8 acres. Lightning, the most common ignition source, is responsible for starting 39 of the 55 fires (72%). Sixteen fires (28%) can be attributed to human caused ignitions. The largest single fire was human caused resulting in 214 acres. The average fire size was 4.1 acres.

Table 3-1: Loon Wildland Fire Trends

Decade	Number of Fires	Acres Burned
1970's	16	2.5
1980's	20	216
1990's	15	6.8
2000-2006	4	1.5

Approximately 55 percent of the planning area falls within the Palmer Valley Wildland Urban Interface, identified in the Union County Community Wildfire Protection Plan. Two other wildland urban interface areas (WUIs) are adjacent to the planning area boundary; Tollgate/Spout Springs to the northwest and Pumpkin to the southwest. Fuel conditions on the National Forest are transitioning to complex conditions that place these WUIs at risk to damage from large fires. Though the Palmer Valley WUI is down slope from the project area, fire can be carried by prevailing winds. Areas of high risk to fire starts need to be isolated, such as along the Highway 204 corridor. It is important to maintain fuel conditions that increase the likelihood for successful suppression efforts along ridgetops. Fire behavior can be modeled across the landscape by looking at components of fire regime, condition class, and fuel models. Existing fuel conditions can be used to express potential size of wildfires, the ability for successful containment, and public or firefighter safety.

Current Fuel Conditions: The use of fire regime provides a general description of the role fire plays in an ecosystem, characterized by fire frequency, intensity, seasonality, duration, and scale (patch size). Plant association groups found in the planning area indicate three fire regimes (see table 3-2). Historic landscape fire behavior for the planning area can be characterized by two fire regimes, the frequent low intensity regime (Regime 1) and the mixed severity regime (Regime 3). Expected fire behavior can change within fire regimes when fire return intervals are missed. The results of missed fire return intervals are changes in stand composition and structure. Uncharacteristic fire behavior can be expected from increased stand density, surface fuels, and tree size class distribution. This changed condition is described as a condition class and how fuels are interconnected between fire regimes is displayed using fuel models.

Table 3-2: Fire Regimes found in the Loon Planning Area

Fire Regime Group	Severity	Frequency Interval	Acres	Percent of Planning Area
Regime 1	Low	0 to 35 Years	4,999	25

Fire Regime Group	Severity	Frequency Interval	Acres	Percent of Planning Area
Regime 3	Mixed	35 to 100+ Years	14,261	71
Regime 5	High	200+ Years	852	4
Unclassified	N/A	N/A	61	0**

*Regime 1is frequent fire regime that includes dry upland forest of ponderosa pine and Douglas fir.
Regime 3 is a mixed fire regime that includes moist woodland and upland forest.
Regime 5 is an infrequent fire regime that includes cold and very moist upland forest.
**Negligible amount, <0.5%

Condition Class 1 is assigned to stands that are within or near the historical range for the Fire Regime. The risk of losing key ecosystem components is low. Fire frequencies have departed from historical frequencies by no more than one return interval. Vegetation attributes such as species composition and structure are intact and functioning within an historical range.

Condition Class 2 is assigned when fire regimes have been moderately altered from their historic range. There is moderate risk to losing key ecosystem components. Fire frequencies have departed from historic frequencies by more than one return interval resulting in moderate changes tone or more of the following: fire size, frequency, intensity, severity, or landscape. Vegetation attributes have been moderately altered from historic ranges.

Condition Class 3 is assigned when fire regimes have been significantly altered from historic ranges. The risk of losing key ecosystem components is high. Fire frequencies have departed by multiple return intervals resulting in dramatic changes to one or more of the following: fire size, frequency, intensity, severity, or landscape patterns. Vegetation attributes have been significantly altered from their historic ranges.

Condition class is a description of how far current stand fuel conditions and fire behavior have deviated from historical conditions. Departure from historical fire return intervals were caused by one or more the following activities: fire suppression, timber harvesting or grazing. The higher the condition class number the higher the relative risk of uncharacteristic fire causing losses to natural resources, other key ecosystem components or human values. Acreage distribution for the analysis area is shown in Table 3-3, see also Appendix F for a mapping of Condition Classes for the planning area.

Table 3-3: Loon Condition Classes

Condition Class	Acres	Percent of Planning Area
1	5,914	29
2	11,952	59
3	2,322	12

Nearly 60 percent of the planning area has moved into Condition Class 2 with another 10 percent in Condition Class 3, indicating a transition to more complex fuel conditions. Fuels that would have historically been consumed during periodic wildfires have increased; in many areas surface and aerial fuel loading are above historic levels.

Fuel Models are used to characterize fuel conditions on the landscape. They provide a way to model fire behavior, extent, and ease of control. The following Fuel Models are represented in the planning area using the Northern Forest Fire laboratory 13 standard fuel models:

- Fuel Model 1: Grassy slopes in the Loon Analysis Area are typically classified as a Fuel Model 1 (short, cured grass). Fire spread is governed by the fine, very porous, and continuous herbaceous fuels that have cured or are nearly cured. Fires are surface fires that move rapidly through the cured grass and associated material. Very little shrub or timber is present, generally in less than one-third of the area.

- Fuel Model 2: Where grass interfaces with open stands of timber or shrubs, Fuel Model 2 (timber with grass understory) is used. Fire spread is primarily through the fine herbaceous fuels, either curing or dead. These are surface fires where the herbaceous material, in addition to litter and dead-down stemwood from the open shrub or timber overstory, contributes to fire intensity. Open shrub lands and pine stands that cover about one-third of the area may generally fit this model. Such stands may include clumps of fuel that generate higher intensities and may produce firebrands.

- Fuel Model 5: Fuel Model 5 models shrubs, and for this analysis area, thick stands of small natural regeneration or reproduction resulting from harvest activity. Fire is generally carried in surface fuels that are made up of litter cast by shrubs and grasses or forbs in the understory. The fires are generally not very intense because surface fuel loads are light, the shrubs are young with little dead material, and foliage contains little volatile material.

- Fuel Model 8: A Fuel Model 8 (closed canopy, short-needled conifer with compact litter layer) is used for younger stands where little surface fuel loading exists. Slow-burning ground fires with low flame lengths are generally the case, although the fire may encounter and occasional "jackpot" or heavy concentration that can flare up. Closed canopy stands of short-needle conifers or hardwoods that have leafed out support fire in the compact litter layer. This layer is mainly needles, leaves, and occasionally twigs, as little undergrowth is present in the stand. Fuel Model 8 is relatively benign, exhibiting low rates of spread and intensities under almost any weather or fuel moisture scenario. Its fuel characteristics and fire behavior is desired for safe suppression efforts. Only under severe weather conditions involving high temperatures, low humidity's, and high winds do the fuels pose fire hazards.

- Fuel Model 9
  Fires run through the surface litter faster than Model 8 and have longer flame length. Closed stands of long needled pine like ponderosa are grouped in this model. Concentrations of dead-down woody material will contribute to possible torching out of trees, spotting, and crowning. Fire spread is mainly within the surface litter and the understory of these stands.

- Fuel Model 10: This fuel model is the most volatile of the forest fuel models, and is typically used to characterize high intensity fire scenarios. The fires burn in the surface and ground fuels with greater fire intensity than other timber litter models. Dead-down fuels include greater quantities of 3-inch (7.6 cm) or larger limbwood resulting from overmaturity or natural events that create a large load of dead material on the forest floor. Crowning, spotting, and torching lead to potential fire control difficulties. Any forest type may be considered if heavy down material is present; examples are insect or disease ridden stands, wind-thrown stands, over-mature situations with deadfall, and aged light thinning or partial-cut slash.

Table 3-4: Acres and Percent of Planning Area by Fuel Models

Fuel Model	Acres	Percent of Area	Flame Length
1	64	0*	4 feet
2	8,980	45	7 feet
5	3,775	19	6.5 feet
8	5,970	30	1 foot
9	694	3	3 feet

Fuel Model	Acres	Percent of Area	Flame Length
10	705	3	5.7 feet

*Negligible Amount, less than 0.5%

Fire Behavior

Fire behavior across the planning area is quite variable. Past timber harvest along the ridgetops has created plantations and open stand conditions from thinnings and shelterwood harvests. The intermix of plantations and early sussessional stages provide anchor points for suppression actions while the canopy moderates the intensity of ground fire such that hand actions can be taken. It is important to preserve and expand areas of low fire behavior. Approximately 64 percent of the planning area has rates of spread that would deliver fire quickly across the landscape and high flame lengths that limit the ability of ground crews to safely and effectively take suppression actions.

Potential fire behavior has modeled using the CrownMass program, (Fire Program Solutions, 2001) for a representative unit, Unit 35. The program is designed for assessing crown fire potential and predicting surface fire behavior; values where determined using stand exam data and photo series information for fuel loads and is summarized in table 3-5.

Table 3-5: Predicted Fire Behavior

Surface Rate of Spread (ch/hr)	11.3
Surface Flame Length (ft)	6.7
Fire Type	Passive Crown Fire
Spotting Distance From Surface Fires (mi)	0.17
Spotting Distance From Torching Trees (mi)	0.82

Passive crown fire is more commonly known as single tree and group tree torching with the potential for spot fires to be generated up to .82 miles from the torching tree. Passive crown fires can develop into running crown fires with the passage of a cold front or a significant wind event.

It is generally accepted that fires with flame lengths in excess of four feet cannot be affectively and safely fought by ground crews through direct attack methods. The predicted flame length as determined by CrownMass is 6.7 feet. The fire line production rate for a three person engine crew in Fuel Model 10 (Fireline Handbook, Jan 1988) is 12 chains/hour. The surface spread rate as determined by CrownMass is 11.3 chains/hour. As long as fire intensity remains moderate, around 4 foot flame lengths, a three person engine can contain this fire but is on the edge of their production capability.

Environmental Effects to Fuels

Environmental Effects of Alternative A to Fire and Fuels

No new management activities would occur and natural processes would continue. Fuels would increase through time as forest stands became increasingly homogeneous in composition and structure. Shade tolerant species would out-compete early seral ponderosa pine and western larch creating a more complex structure of aerial fuels. As tree populations reach the carrying capacity of the site, mortality

would represent a greater proportion of the stand, and dead-standing trees and surface fuels would accumulate. The increased fuel loading would result in uncharacteristic fire behavior trending to larger and more severe fires on the landscape, potentially threatening the Palmer Valley WUI with resource damage. Forest stands and surface fuels would trend to heavier surface fuel loadings across all forest settings, moving those stands not already classified as Fuel Model 10 into Fuel Model 10.

Environmental Effects of Alternative B to Fire and Fuels

Because of the reduced surface and aerial fuels the treated stands would be classified as a Fuel Model 8. If a wildfire were to initiate in a treated stand, the result would be a surface fire that burns with the intensity that would allow safe and successful suppression actions to be taken. Spotting from torching trees would be reduced and crown fire potential would be all but eliminated. Table 3-6 displays the changes in fire behavior using the CrownMass Model with stand data altered to reflect the harvest, thinning, and slash treatments that included the removal of dead surface. Post harvest slash was assumed to be treated except for a small increase in harvest slash expected to remain of site after slash treatment.

Table 3-6: Fire Behavior Characteristics – After Treatment

Surface Rate of Spread (ch/hr)	2.4
Surface Flame Length (ft)	1.0
Fire Type	Surface
Spotting Distance From Surface Fires (mi)	0.04
Spotting Distance From Torching Trees (mi)	0.81

This alternative meets the fuels management objectives stated in the Purpose and Need of this EA. The treated stand would meet the character of Fuel Model 8. Canopy base height would be increased as a result of understory thinning. The surface rate of spread is well under the production capability of an engine with a three person crew and flame lengths allow for direct attack. Due to reduction in the density of the canopy and the increase in the canopy base height the fire type becomes a surface fire. The potential for fire spread to private land in the Wildland Urban Interfaces, from spotting or exceeding the production capability of suppression resources, is greatly reduced from that of pre-treatment conditions.

Environmental Effects of Alternative C to Fire and Fuels

Like Alternative B, treated stands would meet the character of Fuel Model 8, increasing the ability to successfully suppress a wildfire with a hand crew. Alternative C provides a greater focus for treatments along State Highway 204. Even though Alternative C treats fewer acres along the ridge tops than Alternative B, it treats approximately 450 more acres along the highway and Little Phillips Creek with a net increase of only 140 acres of total treatments. The reduction of large and fine fuels adjacent to the highway would increase the success of containing a fire with a hand crew. The reduced crown and surface fuels on the slope would aid in making the ridge top a successful control line for confining fire size and keeping it out of the WUI. The CrownMass Model indicates treatment would increase the capability of a 3 man engine crew to suppress a fire, keeping it small. This is important along the Highway which has an increased risk to traffic related human caused fires. The increase capability

would allow the crew to keep a fire from moving up the slope into the Palmer Valley WUI and maintain the highway corridor as an escape route. Treatments in other areas would also allow a three person engine crew to successfully suppress and wildfire and provide interconnected areas of low fuels to aid in the suppression and containment of large wildfires.

Environmental Effects of Alternative D to Fire and Fuels
This alternative treats only units with a primary focus of fuels reduction and modifies treatment adjacent to Highway 204 such that only danger trees would be cut and fuel prescriptions to modify crown closure would not occur within the Little Phillips Creek RHCA. The cut danger trees would be left in place creating heavier fuel conditions along the highway. Only fine fuels would be treated by pile and burning. Increased fuel loads along the highway, particularly large fuels, makes it harder for a 3 person hand engine crew to contain a fire. The increased large fuel slows line construction and increases the risk of a fire start moving upslope. Upslope of the RHCA tree crowns would be reduced and a portion of fine fuels removed such that a fire would still be expected to remain on the ground. The ridgetop would still aid in suppression efforts to keep fire out of the WUI.

This alternative would not be as effective as Alternative B and C in maintaining desired fuel levels along the interior ridgetops that could be used to confine fire size. Alternative D focuses mainly on the Highway 204 corridor, the area with greatest risk for traffic related fire starts; 60 percent of the proposed treatments would occur here. Fuels in stands that would have been treated with a timber harvest would continue to transition to more complex fuel structure, increasing the risk for a large fire moving through the Palmer Valley WUI; only 40 percent of the proposed treatments are within the WUI; however the fuel treatment above Highway 204 would be aid in keeping fire from moving into the WUI. At the stand level pre-treatment and post treatment stand characteristics and fire behavior is the same as in Alternative B.

Air Quality

This summary analysis is taken from the fuel specialist report for the Loon Fuels Reduction Project.

All of the Walla Walla Ranger District is considered a Class II Airshed. Areas of potential impact from burning operations would likely be confined to the Elgin area particularly if a strong, nighttime inversion develops or stable air keeps smoke from dispersing. La Grande is approximately 21 miles from the southernmost planning area boundary. Impacts to downwind communities are not likely to exceed the DEQ thresholds.

Environmental Effects of Alternative A to Air Quality
There would be no impact to air quality from prescribed fire. Models indicate that the amount of particulate material generated by a wildfire is larger than that from prescribed fire because more fuels are consumed. Though smoke from summer wildfires is more persistent, review of air quality measurements during high fire years does not indicate air quality standards have been exceeded.

Environmental Effects to Air Quality for Alternatives B, C, and D.
Past experience has shown that significant air quality declines are limited in scope to the general burn area and of short duration with the most significant impacts occurring under strong, persistent inversions or highly stable air masses. Burn prescriptions avoid ignitions under these conditions. Broadcast burning also produces higher risk for smoke impacts to communities than pile burning because it can smolder over a longer period of time. Table 3-7 shows the emissions produced for every 100 acres of natural fuels when underburning and broadcast slash burning are used. Calculations were made using the Fire Emission Production Simulator (Version 1.1) using the same fuel loading and environmental

conditions used for the CrownMass program. The Loon project proposes 300 to 420 acres of underburning and jackpot burning; smoke would be short in duration, less than five days.

Table 3-7: Smoke Emissions per 100 acres burned

Type of Burn	Tons Consumed	Total CO	Total CH4	Total PM2.5
Broadcast Natural Fuels	314	51	2	4
Broadcast Slash Fuels	2790	439	21	36

Hand and grapple piles would be ignited under very moist conditions in the late fall, possibly after an early snowfall. Post harvest conditions would determine the amount of grapple piling that would occur, many areas could be masticated without burning. The heat generated by the piles should carry smoke to the upper atmosphere for dispersal. As the piles cool, smoke would be retained in the area and drift downhill into the valley at night and early morning. Smoke from pile burning is not expected to be of an extent or duration to cause significant impacts to downwind communities. Table 3-8 gives an indication of the scale of proposed burning.

Table 3-8 Summary of Fuel Treatments

Alternative	Underburn/Jackpot	Unit Pile and Burn	Mechanical	Tops Attached and Burn pile	Total Treatment Acres *
Alternative B	583 acres	240 acres	1,101 acres		1,924 acres
Alternative C	548 acres	421 acres	848 acres	430 acres	2,166 acres
Alternative D	502 acres	130 acres	302 acres	350 acres	1,195 acres

* Total Treatment acres do not add in Alternative C and D because treatment areas overlap in Unit 42 in the areas where danger trees are cut, hand piling and burning would occur.

Any prescribed burning operations within the project areas would comply with the State of Oregon's Smoke Management Implementation Plan, and would be implemented within guidelines of the Smoke Management Program. "Special Protections Zones" have been established around each of the cities of Oregon, which are not meeting the Federal Clean Air Act PM-10 Emission Standards. The nearest zone is La Grande, Oregon; current regulations require smoke emissions within 60 air miles radius of the city be documented. The intent of the zones is to minimize the chances of smoke producing activities adding to the current air quality problems. This can be accomplished by following the Smoke Management Program Guidelines and by contacting the State Forestry Weather Forecaster prior to burning. The state will implement restrictions on burning when wind predictions indicate smoke could be carried into sensitive areas. A listing of additional requirements is available in the Oregon Smoke Management Plan. The State of Oregon Smoke Management Plan also has certain areas that are being monitored by detection devices.

Impacts from smoke would be restricted to individual dwellings within the immediate area for short periods of time. Normally burn windows precede a rain front which clears smoke quickly as the front passes. The burning would occur before extensive home wood heating and at a time when air can mix. Peak impacts to air quality from smoke occur in the late winter months, a time when fuel burning does not occur. The planning area is more then 40 air miles from the nearest Class I Wilderness area. Smoke would be visible but historical record from EPA does not indicate fall and spring burning exceeds health standards in communities being monitored for air quality. Peak levels of smoke impacting air quality would be the same between alternatives because for any day of burning, the same amount of acres would be burned. The duration of burning varies by alternative; Alternative B burns approximately 845 acres;

Alternative C, 1,400 acres; and Alternative D, 980 acres. The burning could be reduced by 400 acres in Alternative C and D if tops taken to landings could be removed as chip wood. Burning only occurs within the requirements of the State of Oregon Smoke Management Plan and would not exceed air quality standards.

Soils and Stand Productivity

The following is a summary of the analysis found in the Soil Scientist's report for the Loon Fuels Reduction Project and supplemented with additional information in the EA. The report can be found in the Project Analysis File. The soil scientist reviewed soil attributes for the various soil types found in the Planning Area using the National Forest Soil Resource Inventory (SRI). Soil impacts were estimated using alternative descriptions with associated impacts from mechanical treatments and burning. The existing condition of the soils as determined by field review and knowledge gained from monitoring the proposed types of actions on the Forest.

The Forest Plan provides guidelines for maintaining soil productivity on page 4-80. Acceptable soil productivity is maintained when 80 percent of an activity area is in a condition of acceptable productivity potential. The guideline further defines acceptable productivity potential in terms of compaction, displacement, molding of soil, and burn intensity. Soil conditions that exceed standards are referred to as detrimental soil conditions. Though it is not possible to determine where detrimental soil conditions would occur in an activity unit, it is possible to estimate the amount of detrimental conditions within the unit based on past forest monitoring and research. These estimates will be disclosed for each alternative.

The Umatilla National Forest Soil Resource Inventory (SRI) was used to characterize the soils in the planning area. Many of the units proposed for vegetation treatments are on soils with considerable volcanic ash content. Approximately 80 percent of the acres proposed for forwarder logging in Alternative B are on ash soils with a high risk for compaction. Forwarders have been shown to reduce detrimental compaction because they have low ground pressure and operate over slash. Ash soils are susceptible to compaction in both wet and dry conditions as well as water erosion, displacement, and dry dusting. All soils in the planning area have at least some ash-influence in the surface layer. The steeper slopes have low levels of ash while the flat ridgetops and valley bottoms have higher levels.

Environmental Effects of Alternative A, No Action, to Soils and Stand Productivity

There would be no additional impacts to soils because fuel reduction and timber harvest activities would not occur. Conditions in the analysis area would remain much the same as now. Slow accumulation of woody material, including smaller branches and duff, would continue unless interrupted by wildfire. Organic material buildup on the surface would increase productive capacity somewhat but increase the risk of widespread, high intensity wildfire that could remove large amounts of this material at once over large areas. The lower intensity, mosaic pattern of prescribed fire would not occur with subsequent release of nutrients for plant uptake and invigoration. Higher intensity and more severe wild fires would increase the risk to larger areas of severely burned soils.

Environmental Effects to Soils and Stand Productivity Common to Alternatives B, C, and D.

Direct and Indirect Effects:

Monitoring of operations proposed by these alternatives for like vegetation and soil types on the Forest indicates soil impacts exceeding detrimental conditions typically are in the range of 2 to 5 percent of an activity unit for harvester/forwarder and 4 to 8 percent when fuel and slash treatment are combined.

Table 3-9 Summary of Detrimental Conditions from Monitoring of Various Actions on Forest

Activity	Range of Detrimental Soil Condition within an Activity Unit.
Harvester/forwarder	2 to 5 percent
Skyline/Helicopter	1 to 2 percent
Slash Treatments	0 to 3 percent
Broadcast Burning	Less than 10 percent, depending on slash loads; 0 to 5 percent is the norm.

Displacement and erosion hazard is nearly eliminated by the use of harvester/forwarders, skyline and helicopter yarding. When using a forwarder occasional areas of bare soil occur in narrow (1 to 2 feet wide), short sections (typically less than 25 feet in length) and in a mosaic pattern that is not conducive to concentrating water sufficient to move soil. The surrounding area is not disturbed because logs are lifted and placed onto the forwarder. The slash deposited on the routes from manufacturing logs further reduces soil impacts caused by displacement. When mechanized slash treatments are used, the low ground pressure equipment remains on the forwarder routes, confining impacts to the existing trails. The burning of piles or slash within the trails is done at a time when moisture levels are high enough to retain duff and minimize areas of exposed soil. Displacement from helicopter and skyline yarding would be nearly confined to the landings. Helicopter yarding totally suspends the logs and skyline yarding suspends one end. For the most part skyline corridors would be parallel and displacement associated with converging skyline corridors near the landing would be minimized. As logs approach the tower, there is increased lift of logs because of the tower height. Surface debris would be retained to filter and trap erosion near the landings and areas adjacent to skyline corridors. There are no constructed landings when parallel corridors are used. Logs would be decked either above or below the landing requiring no clearing.

Monitoring or sale administration and service contracts have demonstrated that soil impacts associated with compaction and molding are being minimized. Operations are controlled during periods of fluctuating moisture and freeze/thaw conditions. The manufacturing of logs in the forwarder route creates a slash cushion for equipment to operate on. The low ground pressure of both forwarders and mechanical slash equipment further reduces the amount of detrimental compaction. Compaction associated with helicopters and skylines would be confined to landings and road system. Use of mechanical fuel treatments causes additional equipment traffic while generally reducing the number of spots of severe burn intensity. Mastication (slashbusting) equipment is usually mounted on small-body excavator bodies with wide tracks. They have relatively low ground-pressure and can work on top of downed logs and existing or created slash. Additional compaction would be expected as well as some displacement when equipment turns. Operation on downed slash and other woody material and use of existing trails keeps additional compaction and displacement effects very low. Monitoring of grapple-piling operations on the Umatilla indicates detrimental soil impacts in the 0-2% range.

Prescribed fire and pile burning causes areas of severe fire intensity as well as areas of exposed soil. The prescription for underburning and pattern of heavy fuel concentrations are prime determining factor affecting the extent of high severity burn areas. Contemporary prescriptions for underburning rarely create severe burn conditions and total area of exposed soils is expected to be very small, usually 0 to 5 percent in broadcast treatment areas and up to 10 percent of treatment areas if there are numerous concentrations of heavy fuels loadings resulting from either harvest activity or down woody levels. Exposed soil would be expected to be scattered in a mosaic pattern similar to heavy fuel loading patterns, rarely in continuous areas to become an erosion hazard.

Jackpot concentrations of fuels have a higher likelihood of severe heat levels but have been achieving acceptable results when prescriptions are followed. The extent exposed soil is highly variable depending on the concentrations, number of concentrations, location, fuel loadings, and burn conditions.

Associated with the harvest is approximately 1,800 feet of temporary road construction. This road would access Units 27 and 28. The road would be decommissioned after use. The compaction and displacement associated with the road construction would be a short term detrimental impact to soil productivity. The disturbance represents approximately 0.8 acres of detrimental soil condition, about 1 percent of the activity area, and would not increase the detrimental conditions within the unit to a level of concern. The proposed decommissioning includes surface treatment (ripping or other tillage activity) which would improve water infiltration, reduce or eliminate erosion hazard, and provide a seed bed for revegetation but leave the site with reduced productive capacity. Monitoring of past decommissioning has show good vegetation growth, including trees, within 10 years.

The following table compares each alternative for estimated detrimental soil impacts after the activity. It includes the existing condition. The table indicates that no activity would exceed forest plan standards for detrimental soil conditions, see Table 3-11 for unit estimates for the proposed action, Alternative B. Estimates for activity units would not change between alternatives; only the amount of acres changes because each alternative treats a different number of acres.

Table 3-10: Comparison of Soil Impacts by Alternative

ACTIVITY MEASURE	ALTERNATIVE			
	A	B	C	D
Total Gross Acres Activity	0	2072	2212	1196
Total Detrimental Disturbance, including existing condition.	0	192	234	59
Units Exceeding Plan Standards	0	0	0	0
Units Requiring Additional Mitigation	0	0	0	0

Cumulative effects: Previous management activities over the past several decades compound to produce the existing condition (see Table 3-11 for estimates of the current detrimental soil condition by activity unit). Activities include road building, timber harvest, site preparation, livestock grazing, fire suppression activities and prescribed fire. The concern, from a soils standpoint, is whether additional impacts to the soil resources resulting from proposed activities would accumulate adverse impacts to soil characteristics sufficient to affect productivity. Cumulative effects relative to erosion hazard is not relevant within treatment units as surface recovery occurs rapidly enough to eliminate this as a cumulative concern. An additional benefit of assessment of existing conditions is the identification of areas that might benefit from some rehabilitation treatments.

Field review indicates detrimental soil conditions contributed by prior tractor skidding is well recovered. After cessation of activity with this proposal, several years of relative inactivity from ground-disturbing operations would allow natural processes to stabilize the area further.

Use of harvester/forwarder equipment minimizes additional displacement and compaction effects. In conjunction with use of existing trails or landings, when feasible, proposed activities can be expected to

stay well within Plan guidelines for detrimental soil conditions including residual consideration of effects from prior activities even with the proposed slash and fuel treatments. When mechanical fuel treatments are proposed equipment use generally overlaps with what was used for timber harvest with little additional increase in detrimental disturbance (see Table 3-11).

Table 3-11: Cumulative Detrimental Soil Condition by Unit, Alt. B

Activity Unit	Existing Disturbance Condition	Existing Detrimental Soil Condition %	Estimated Added DSC from Harvest Activity	Estimated Added DSC from Fuels Activity	Total % Potential DSC Post-Activity	Unit Treatment Acreage	Acres Detrimental Soil Conditions
1	M	8	4	2	14	60	8
4B	L	3	4	2	9	20	2
7	L	3	3	2	8	25	2
8C	L	3	3	2	8	50	4
10	L	3	4	2	9	25	2
11A	L	3	4	3	10	23	2
11B	L	3	4	3	10	10	1
12	L	3	4	2	9	21	2
13	L	3	3	2	8	79	6
14	L	3	3	2	8	41	3
17	L	3	4	2	9	20	2
18	L	3	4	3	10	23	2
19	L	3	4	3	10	49	5
20	L	3	4	3	10	72	7
21	L	3	4	1	8	159	13
23	L	3	4	3	10	36	4
26	L	3	4	3	10	92	9
27	L	3	4	3	10	74	7
28	L	3	4	3	10	27	3
29	L	3	4	3	10	58	6
30	L	3	4	3	10	96	10
33	L	3	4	3	10	97	10
34	0/L	1	4	1	6	36	2
35	L	3	4	1	8	89	7
36	M	8	4	3	15	22	3
37	M	8	4	0	12	120	14
38	L	3	4	1	8	65	5
39	M	8	4	2	14	274	38
40	0/L	1	4	2	7	57	4
41	0/L	1	4	3	8	69	6
42	0/L	1	4	3	8	35	3

Water Quality

The following is a summary of the analysis found in the hydrologist's report for the Loon Fuels Reduction Project and supplemented with additional information in the EA. The report can be found in the Project Analysis File. The Loon Planning Area falls within the Upper Grand Ronde sub-basin but splits several watersheds. The Analysis Area used to evaluate impacts to water quality for this project included portions of two HUC 5 Watersheds and six HUC 6 Subwatersheds (SWS), all tributary to the Grande Ronde River, see Table 3-12.

Existing Hydrologic Conditions

The Loon Analysis Area has a mixed maritime-continental climate with seasonal extremes of temperature and precipitation. Most precipitation comes as winter rain or snow between November and May. Annual precipitation increases with elevation from less than 15 inches near Summerville in the Grande Ronde valley to about 50 inches in the higher elevations of the analysis area. Stream flow is generally dominated by snowmelt with peaks in the spring and low flow in August and September. Regional rain-on-snow events in 1964 and 1996 caused large scale flooding.

Topography of the analysis area is characterized by uplifted basalt plateaus and deeply dissected canyons with moderate to steep sideslopes. Headwaters of the streams of the analysis area are in the low gradient uplands and flow to the forest boundary and on to the Grande Ronde River through steep canyons. Generally inaccessible, the channels are undisturbed and in good morphologic condition. Little Phillips Creek is an exception, with Oregon State Highway 204 dominating its channel and floodplain. Upland areas are sometimes poorly drained with boggy areas as is the case in the headwaters of Gordon Creek.

Little Phillips Creek is a degraded system, dominated by State Highway Oregon 204. The creek has been channelized and is highly controlled. Down wood is removed within the highway right-of-way to prevent damage to the road bed by diversion of flows. The stream is perennial in upper reaches and intermittent in lower reaches. The sediment regime is dominated by erosion caused by confinement by the highway and winter sanding during icy conditions. The channel is eroded to bedrock in many places. With a north/south orientation, the creek naturally has little shade during the high sun angle periods of the day and the highway corridor has removed shade potential. Fish are present and listed species occupy some reaches of the stream (see the Fisheries report in this document).

Roads: Slope position of roads is a critical factor in the interaction between roads and streams. Valley bottom roads have the most direct effect on streams and riparian areas including accelerated erosion, loss of streamside shade, and affect to channel morphology and floodplain function. Because roads increase the efficiency of watershed runoff, the timing of streamflow can be affected. Road density and miles of road inside Riparian Habitat Conservation Areas (RHCAs) are used as indicators of the potential for roads to affect water quality. Due to the relatively flat topography of the plateaus and very steep dissection of drainages, road location near channels is low relative to channel length in these SWS (Table 3-12).

Table 3-12 Loon Analysis Area SWS, Acres, Road Density

HUC 5 Grande Ronde River Cabin Creek		NFS Acres	SWS Acres	Road Density Mi/sq mi	Mi. Rds/ Mi. Fish Stream	Mi. Rds/ Total mi. Stream
170601041101	Phillips Creek	17377	24775	3.9	1	0.2
170601041102	Gordon Creek	4232	18855	3.3	0.4	0.2
170601041104	Cabin Creek	5084	15891	2.6	0	0.1

HUC 5 Upper Grande Ronde-Lookingglass						
170601041001	Upper Lookingglass	13830	15169	3.2	0	0.1
170601041002	Little Lookingglass	20572	2387	3	0.2	0.1
170601041004	Lower Lookingglass	6943	11095	2.4	0	0

Water quality: Within the Analysis Area, water temperature data has been collected at several sites on Lookingglass Creek and one on Phillips Creek (Table 3-12). Lookingglass Creek has many cold water springs in its headwaters which account for much of the flow and for its cold water temperature.

Table 3-13 Water Temperature Data in the Analysis Area

Data Collection Site	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Lookingglass Cr above Springs											62	63	60		
Lookingglass Cr abv Eagle Cr	53	51	52	53	NA	51	52	53	52	52	53	52	52	52	53
Lookingglass Cr @ FS Bdy	55	54	56	56	NA	55	55	55	55	56					
Phillips Creek @ FB													63	61	61

Clean Water Act: The Environmental Protection Agency has designated the State of Oregon as having responsibility to implement the Clean Water Act. The Clean Water Act requires that water quality standards be developed to protect beneficial uses and a list be developed of water quality impaired streams (303d list). The State of Oregon completed the Upper Grande Ronde River Sub-Basin Total Maximum Daily Load (TMDL) and Water Quality Management Plan (WQMP) in December 1999. The following TMDLs were approved by EPA for the Upper Grande Ronde: Temperature, Sediment, Nitrogen, and Phosphorus. The TMDL analysis assigned pollutant loads for water temperature and the WQMP established the means to meet the TMDL and remove streams from impairment listing (303d).

Beneficial Uses for water in the Grande Ronde Basin; water quality must be managed to protect these uses.

- Aquatic Life Uses: Bull trout, salmon and trout spawning, rearing, migration and other aquatic life.
- Recreation: Fishing, Hunting, Boating, and Water Contact Recreation
- Water Supply: For Private and Public Domestic, Industrial, and Agricultural uses
- Miscellaneous Uses Wildlife, Hydro Power, and Aesthetic Quality

In the Upper Grande Ronde Sub-Basin background stream temperatures exceed those required for fishes and no additional anthropogenic inputs that can raise the water temperature are allowed. See box for stream temperature standards to protect designated fish in the Grande Ronde Basin.

Oregon Department of Environmental Quality (ODEQ) has identified Use Designations and has recently revised its water quality standards based on life stages of fishes. Water temperature standards are based on a 7-day-average maximum:

Gordon Creek, Cabin Creek, and Phillips Creek:

- salmon and steelhead spawning; may not exceed 13.0 degrees Celsius (55.4 degrees Fahrenheit) January 1 – May 15.
- salmon and trout rearing and migration use; may not exceed 18.0 degrees Celsius (64.4 degrees Fahrenheit)

Lookingglass Creek and Little Lookingglass Creek:

- Bull trout spawning and juvenile rearing; may not exceed 12.0 degrees Celsius (53.6 degrees Fahrenheit).

No TMDL for sediment was developed in the Upper Grande Ronde Sub-basin. The state determined that, "the load allocations provided to address temperature, pH, and dissolved oxygen standard violations, coupled with ongoing efforts by the U.S. Forest Service (USFS) to reduce loads from roads and other sources, will be adequate to address sedimentation and turbidity concerns in the Upper Grande Ronde Sub-Basin."

The Forestry WQMP relies on current laws, management plans, and BMPs to provide the basis for improving water quality in the forested landscape (ODEQ 1999). All federal land management activities must follow standards and guidelines (S&Gs) found in the Umatilla National Forest Plan, as amended by PACFISH (USDA and USDI 1995), and BMPs as defined in the Implementation Plan for 208 (Water Pollution Control Act, PL 92-500, as amended). PACFISH provides management direction in the form of interim Riparian Habitat Conservation Areas (RHCAs) and S&Gs for Key Watersheds. All of the NFS lands in the Grande Ronde River Basin have been designated as Key Watersheds.

The WQMP expects current policies, regulations, BMPs, and adaptive management techniques to minimize unwanted sedimentation from forestry related activities. Habitat conditions are expected to be improved through implementation of BMPs developed for the temperature TMDL which promote riparian conditions that improve channel stability and reduce erosion and promote the protection and recovery of channel morphology to the most stable forms. BMPs are developed by the Forest Service as part of the planning process and includes a commitment by the US Forest Service to meet or exceed standards (see Chapter 2, Design Feature for Specific BMP for this action and Appendix E).

Environmental Effects to Water Quality

Table 3-14 summarizes the major differences between alternatives that would be used in this analysis. Impacts to water quality would be similar in most cases; the scale of impacts would change between alternatives based on the logging systems used and the amount of vegetation management or road construction proposed in RHCAs.

Table 3-14 Harvest Treatments by Alternative

	Alt. A	Alt. B	Alt. C	Alt. D
Harvest acres				
Forwarder	0	1700	1385	553
Helicopter or Skyline	0	373	826	642
RHCA harvest acres	0	45	73	0

Environmental Effects of Alternative A to Water Quality

In this alterative no harvest or pre-commercial thinning would take place. Prescribed burning and road maintenance that would support the proposed harvest in other alternatives would not occur. Current conditions and processes would continue in their development. Water quality improvements realized by repairing road surface drainage or correcting sediment delivery problems would not occur.

Environmental Effects of Alternative B, Proposed Action, to Water Quality

Direct and Indirect Effects

Roads: The 1.800 feet of temporary road construction would increase road density very slightly until the road is decommissioned, not longer than 5 years. There would be no change in open road density, road/stream intersections, or road length in RHCAs because the whole road bed would be recontoured.

Impacts to water quality during the period of road use would be minimized by providing adequate drainage to prevent water from running down the road into the RHCA. Impacts from public use of this road is not likely because the temporary road is behind a barrier, no public use of the temporary road would develop.

Impacts to Water Temperature: With the exception of Units 36, 37, 27 and 28, harvest associated activities and pre-commercial thinning would not occur inside interim PACFISH RHCAs. RHCA widths range from 1-2 tree heights depending on flow regime and the presence/absence of fish (Umatilla National Forest, 1990). Since shade is not being reduced in these areas, there would be no effect to water temperature from these treatments.

Harvest of Units 36 and 37 would remove danger trees and thin crown density within the RHCA of Little Phillips Creek along Highway 204. There would be limited effects to shade. Water temperature could be affected in the perennial portion of Little Phillips Creek where the stream is at the base of the units. Little Phillips Creek is a north south trending stream and RHCA trees provide shade primarily at low sun angles. Solar inputs during mid-day hours cause the highest summer water temperatures. In addition portions of Little Phillips Creek are dry or subsurface during summer months and shade is not the controlling factor on water temperature in these reaches.

Portions of Unit 28 would be forwarded to FR 3725035 inside the RHCA of Gordon Creek for about 550 feet of its length. Forwarder trails would be spaced about every 50 feet and would be 12 feet wide. Some RHCA trees would be felled and removed to locate these trails. About 400 feet of temporary road would also pass through this RHCA. Very few trees are expected to be removed because the road would follow an old template. Much of the road would cross the outer portion of the 300 foot RHCA where trees provide little contribution to shade. Gordon Creek is a north-south trending stream and RHCA trees provide shade primarily at low sun angles. Shade between 10 am and 2 pm would be unaffected. It is solar inputs during these hours that cause the highest summer water temperatures. A solar pathfinder was used to verify this minimal shade effect during a field visit on July 26, 2007. Water temperature effects would not be detectible and the ability of the stream to transport temperature downstream is very limited since it is largely ponded and slow moving in this reach during the annual peak of water temperatures which occurs in late July. Fish habitat begins about a half mile downstream of these units and temperature effects would be negligible.

Pile burning in RHCA areas within units 36 and 37 is unlikely to reduce shade since piles would be built to avoid damage to residual trees when burned. In areas where broadcast or jackpot burning would occur (410 acres), fire ignition for other activity fuel treatments would not occur inside RHCAs but fire would be allowed to back into some RHCAs. No ignition and increased moisture in RHCAs would cause fire intensity to drop and reduce fuel consumption. Impacts to shade from broadcast and jackpot burning would not measurablely reduce shade and potential effects to water temperature would be negligible.

Implementation Monitoring of Forwarder Routes

Twenty-four trails in 10 units of the Abla and Cliffhanger Timber Sales were evaluated for spacing, gradient, and percent bare soil. Standards for trail spacing and gradient were met. An average of 1% mineral soil exposure was measured on forwarder trails. Since trails occur on about 10% of harvest acres, the total soil exposure was about .01% of harvest acres

Sediment: With the exception of the portion of Units 36 and 37 within the Highway 204 corridor, design criteria for timber harvest would include no-harvest in RHCAs of PACFISH/Forest Plan interim widths. Design criteria found in Chapter 2 for logging, noncommercial thinning, and fuel treatments would prevent damage that could contribute to erosion and sedimentation into channels and streams (Belt et al, 1992). Skyline or helicopter logging systems, which cause minimal soil disturbance, would be used on 373 acres.

Skyline systems would suspend at least one end of logs and ground disturbance would be limited to corridors. With helicopter systems mineral soil exposure would be minor and scattered on an otherwise undisturbed ground surface. A cut-to-length/forwarder logging system would be used on 1700 acres in this alternative and on slope gradients that would not exceed 35%. This low disturbance system operates on trails spaced at about 50 feet and operates over a slash bed. Mineral soil exposure is minor and scattered on an otherwise undisturbed ground surface. These logging systems create very little bare ground and therefore would have a very low risk for erosion. Surrounding undisturbed vegetation and RHCA protection would prevent transport of any eroded sediment into surface waters. (See box discussion about implementation monitoring of forwarder routes)

Pre-commercial thinning would be done by hand with no ground disturbance or by mastication which leaves a cover of chipped material on the unit. The risk of erosion from this treatment is low and not likely to carry sediment into streams because RHCAs would not be entered.

In Units 36 and 37 there are several locations where danger trees cut along the highway would cross the channel of Little Phillips Creek with one end suspension. This would pull sediment into the channel and disturb the channel and stream banks leading to increased risk of erosion and to increased sedimentation. On other corridors, erosion control consisting of waterbars and mulching where surface roughness was not sufficient to divert water from the corridor would reduce erosion but not eliminate erosion potential. Generally infiltration would occur before surface runoff accumulated to the degree necessary for erosion. Waterbars would drain corridors at spacing which would normally prevent the development of erosive surface velocities. The combination of limited drainage area and erosion control would reduce and generally prevent surface erosion. Certain low probability high runoff weather events such as intense rainfall could lead to runoff which would overwhelm erosion control and lead to surface erosion in corridors. Where the stream is adjacent to the unit this sediment would likely enter the creek. Where the stream is on the other side of the highway there would be potential for sediment to travel down the ditch and be delivered to the channel through ditch relief culverts or where the creek crosses over to the east (treatment) side of the highway. Where logs would cross Little Phillips Creek it could take 2-3 years for the channel to recover and for effects to decrease to pre-harvest levels. Sediment transport would occur primarily during spring runoff. Road management activities on Highway 204 are the major source of impacts to the channel and sediment regime of Little Phillips Creek. There is a low likelihood that erosion and sedimentation effects of harvest would be detectible above the highway background. The background effects of the highway include erosion caused by channel confinement and sanding during the winter season.

Helicopter logging of the skyline units would reduce disturbance in the RHCA of Little Phillips Creek to small patches of bare ground surrounded by undisturbed ground. It is generally unlikely that erosion or sedimentation would occur on or from these small areas due to short slope length. Trees that would be removed from very near the channel could expose soil in or on the banks of the channel and some sediment could enter Little Phillips Creek. Erosion and sedimentation effects of helicopter logging would be less than with skyline logging.

Unit 28 would be forwarded to FR 3725035 inside the RHCA of Gordon Creek for about 550 feet of its length. Forwarder trails would generally have a slash matt which would reduce potential for compaction and bare soil. There is a low risk of erosion and sedimentation from the development or use of these forwarder trails. (See Implementation Monitoring in the box above)

FR 3725035 is adjacent to a headwater channel of Gordon Creek. The topography is very flat with multiple channel threads, wallows, and bogs. The road is located inside the RHCA for at least 2100 feet. The road would be rocked before use, which would reduce but not eliminate erosion and sedimentation

from the road use. The temporary road used to access Units 27 and 28 would be constructed with minimal cut and fill and would be adequately drained to prevent water from running down the road into the RHCA. The junction with FR 3725035 would be rocked which would reduce but not eliminate erosion and sedimentation from the road use.

Gordon Creek narrows to a single thread below the crossing of FR 3725038. The culvert at this crossing was removed in the mid 1990s. A temporary culvert would be installed for log haul. The location is about a mile above fish bearing habitat. Use of clean gravel as fill material would minimize sedimentation from the installation and removal of this temporary culvert. No excavation in the channel would be necessary for installation or removal of the culvert. The culvert would be sized to carry winter flows and designed to minimize the impacts from failure during a low probability, high runoff event. This is a low gradient reach and late summer flow velocities are low with a limited ability to transport sediment. Long travel times and BMPs that reduce erosion and sedimentation would limit sediment in fish bearing waters during low flows. Spring runoff would carry project related sedimentation. There is a low risk of detectible sediment reaching fish habitat from use of these roads. Removal of the temporary culvert would disturb the channel to a small degree and fines from the aggregate bed would be carried downstream. It is likely that detectible turbidity (water color) would reach fish habitat. It is unlikely that detectible sediment deposition would occur outside of the immediate culvert area.

Road maintenance would occur on all system roads used by a timber sale and would include blading, ditch relief culvert cleanout, and ditch cleanout as needed on portions of FR 3725 and 6300. Road 6300 is adjacent to Little Lookingglass and Lookingglass Creeks. Erosion and sedimentation effects of log haul on forest roads have been the subject of numerous studies. Log haul has been demonstrated to increase sedimentation from hydrologically connected roads during precipitation events, with the effect decreasing as traffic is reduced or ends (Reid 1984). Dry season use of roads or restricting logging traffic during surface runoff from roads can reduce this effect by interrupting or reducing the road-stream connectivity. Umatilla National Forest Commercial Road Use Rules would require log haul to stop when runoff from roads creates turbidity in streams. It states as follows:

> *Commercial use of National Forest roads shall be suspended when Commercial Contract or Permit operations create a continuous discharge of sediment into live streams that result in an increase in turbidity…Visual evidence of this may be identified by the increase in turbidity in live running streams evident at points downstream from the outflows of culverts, ditchlines, or fords. (Umatilla National Forest, 2001)*

In a study of sediment production from forest roads, newly cleaned ditches were found to have a sediment yield substantially more than blading of the road surface or traffic use (Luce and Black 2001). This is likely due to the disruption of armored or vegetated surfaces, leading to a larger supply of fine, erodible sediment in a feature that carries water during storms. Ditch clean out would be used only when ditch function was compromised and would minimize disturbance of existing vegetation and natural armoring, practices which are common on the Umatilla National Forest. Road use restrictions and minimized ditch cleanout would reduce sediment production from road use to the extent possible.

Culvert cleanout and necessary ditch cleanout would lead to immediate reductions in risk to water quality impacts from the road system. This maintenance would improve road drainage and reduce the chance of road failure and washouts. Closed roads would be left in a self maintaining condition. Detrimental effects from ditch cleanout would be short term, less than one year.

Fuel treatments would be a mix of mechanical removal/mastication or piling, hand piling, jackpot burning, and under-burning to treat activity and natural fuels, including ladder fuels. When pile

burning, fire would generally not be allowed to spread beyond piles in order to protect residual live trees. Jackpot and under-burning would be used on a relatively few acres (410 acres) in this project area, in stands where it is compatible with fuel loads and residual tree species. These burns would typically be planned with prescriptions designed to maintain at least 50% of the existing duff. A mosaic burn with patches of exposed mineral soil would be expected. Exposed soil would be surrounded and buffered by remaining duff and vegetation. Slope distances on exposed mineral soil would be short, preventing significant overland flow from developing and the surrounding duff and vegetation would act as a filter, should any sediment move. Natural mulching by needles and leaves would provide some ground cover before the first winter.

The risk of erosion from prescribed burning is limited due to short slope lengths of exposed soil and the risk of sedimentation is low due to surrounding unburned debris and vegetation. However, because mineral soil might be exposed adjacent to channels, a small amount of sediment might enter channels during intense storms and spring runoff for the first year after burning. There is a low risk that sedimentation would occur at levels, which would measurably affect water quality or deposition in channels. The mosaic of unburned vegetation in channels and the current levels of debris and other channel roughness would slow and reduce the transport of any sediment which might enter channels from these activities. This risk would not extend beyond the first growing season after burning due to regrowth of surface vegetation and accumulation of natural mulches.

Residual slash and natural fuels within the RHCA in units 36 and 37 would be hand-piled in areas within 200-300 feet of the road and piles would be burned. Burned and bare soil under these piles would be surrounded and buffered by remaining duff and vegetation.

With the exception of the portions of Units 36 and 37 inside the Little Phillips RHCA, no ignition for any fuels treatment would occur in RHCAs, though fire would be allowed to back into them to provide the benefits of fuel reduction to these areas. The use of black line and natural control points would minimize construction of fire line and reduce this as a source of erosion and sediment. Fire intensity and the extent of fire coverage would generally be reduced in RHCAs because no ignition would occur to maintain the fire. Some mineral soil would be exposed in near channel positions, but less than in the upland portions and with a mosaic pattern. There would be very little effect to existing down material and vegetation density in near channel positions.

Environmental Effects of Alternative C to Water Quality

Direct and Indirect Effects

This alternative would harvest about the same number of acres as Alternative B with fewer forwarder acres and more skyline or helicopter acres. Harvest, fuel treatment, and noncommercial thinning effects would be similar to Alternative B. The treatment area along Highway 204 in the RHCA of Little Phillips Creek would increase to about 73 acres. Trees that pose hazards to the highway would be removed within about 150 feet of the highway in the RHCA. Some of these trees are between the highway and the creek and would be yarded across the creek. There would be less impact to shade in the upper reaches because canopy reduction would not occur in the perennial portion of the stream where the stream is between the road and the unit. Riparian planting would occur where the canopy was opened by hazard tree removal. Pre-commercial thinning would acres and implementation would be the same as in Alternative B.

Roads: Impacts from constructing 1,800 feet of temporary road would be the same as Alternative B. Road density would increase very slightly until decommissioning of the temporary road accessing unit

27, not longer than 5 years. There would be no change in open road density, road/stream intersections, or road length in RHCAs.

Impacts to water Temperature: Water temperature effects would be similar to those described in Alternative B with the exception of Little Phillips Creek. Since a longer portion of Little Phillips Creek's RHCA would have trees removed impacts to water temperature increases occurs over a longer portion of the stream. Local isolated perennial pools and short stream reaches could increase in temperature. Downstream water temperature would not measurably increase since flow is subsurface in the lower reaches of unit 42. Riparian planting could reduce the length of time until shade recovery occurred. Pre-commercial thinning would not affect shade or water temperature because the thinning would not remove trees that contribute to shade.

Sediment: The mechanisms for impacts to water quality from sediment would be similar to Alternative B. The scale of the effects changes for Units 36, 37, and 42 because tree removal within the Little Phillips RHCA increases to 73 acres for the removal of hazard trees and reduce canopy as part of fuel treatments. These units are adjacent to the east side of Oregon State Highway 204. Hazard tree removal would take trees within about 1 ½ tree heights or about 200 feet from the highway and within the RHCA. Danger tree removal is the only treatment proposed when the stream is on the same side of the road as the unit. When the stream shifts to the other side of the road, fuel treatment would occur to the roads edge.

Logs would still need to cross the channel of Little Phillips Creek in several locations with one end suspension. This would pull sediment into the channel and disturb the channel leading to increased risk of erosion and to increased sedimentation. The effects would be similar and somewhat greater in scale than in Alternative B because more RHCA acres would be treated. Road management activities of Highway 204 are the major source of impacts to the channel and sediment regime of Little Phillips Creek. There is a low likelihood that erosion and sedimentation effects of harvest would be detectible above the highway background effects, including erosion caused by channel confinement and sanding during the winter season.

Helicopter logging of the skyline units would reduce disturbance in the RHCA of Little Phillips Creek to small patches of bare ground surrounded by undisturbed ground. Removal of trees between the creek and the highway would increase the risk of disturbance in areas that could erode into Little Phillips Creek. These effects would be smaller than with skyline logging systems and since channel disturbance would be less, would be short term, 1 runoff season. It is unlikely that sediment effects would be detectible.

Unit 28 would be forwarded to FR 3725035 inside the RHCA of Gordon Creek for about 550 feet of its length. A temporary culvert would be installed for log haul on FR 3725035. Mitigations, risks, and effects would be as described in Alternative B.

Other logging effects would be similar to Alternative B. These logging systems would create very little bare ground and therefore would have a very low risk for erosion. Surrounding undisturbed vegetation and RHCA protection would prevent transport of any eroded sediment into surface waters. Pre-commercial thinning would be done by hand and no ground disturbance or risk of erosion from this treatment would occur.

Residual slash and natural fuels within the RHCA in units 36, 37 and 42 would be hand-piled in areas within 200-300 feet of the road and piles would be burned. RHCA acres treated would increase in Alternative C to 73 acres. The risk of sediment effects from fuel treatments in this alternative would be

larger than in Alternative B due to the increase in RHCA treatment acres. It is unlikely that these effects would be detectible.

The effects of road use would be similar but slightly less than in Alternative B.

Environmental Effects of Alternative D to Water Quality

Direst and Indirect Effects
This alternative would harvest fewer acres than either Alternative B or C and there would be no fuel thinning treatment inside the RHCA of Little Phillips Creek however danger trees would be cut and left except when a hazard to traffic or would cause damage to the highway. Natural fuels piled and burned and tree planting would occur as needed. No harvest is located on the FR 3725035 or 038 road system. No forwarder trails through the RHCA of Gordon Creek would be required, no temporary road would be built and, no temporary culvert would be installed. Effects from noncommercial thinning would be similar to Alternative B because there is no change in the proposed acres treated.

Roads: No temporary roads would be constructed. There would be no change in road density, road/stream intersection, or road length in RHCAs.

Impacts to Water Temperature: Impacts to water temperature in Little Phillips Creek would be similar to Alternative C but of lower scale because the proposed thinning inside the RHCA for fuels objectives would not occur. There would be no effect to water temperature from proposed harvest activities outside of Little Phillips Creek. Design criteria would protect shade on stream channels. PACFISH interim RHCA widths range from 1-2 tree heights depending on flow regime and the presence/absence of fish (Umatilla National Forest, 1990). Implementation of PACFISH interim RHCAs would prevent the removal of any shade. Pre-commercial thinning would not affect shade or water temperature.

Sediment: Impacts to Little Phillips Creek from the removal of danger trees and piling of slash and natural fuels would be similar to Alterative C. Logs may still be pulled across the stream channel. Effects of temporary culvert installation and removal would not occur.

Summary and Comparison of Direct and Indirect Effects

Roads: In Alternatives B and C road density would increase very slightly until decommissioning, not longer than 5 years. There would be no change in open road density, road/stream intersections, or road length in RHCAs.

Water Temperature: Water temperature would not measurably increase under any action alternative. PACFISH RHCAs would protect shade and water temperature. Danger Tree removal, canopy reduction for fuels treatment, and road or forwarder trail construction could remove some trees that provide low sun angle shade to the headwaters of Gordon Creek and to Little Phillips Creek. Effects to water temperature would be negligible.

Sediment: The scale of sediment effects of proposed treatments would vary by alternative. All alternatives would bring logs across the channel of Little Phillips Creek with one end suspension. This would pull sediment into the channel and disturb the channel leading to increased risk of erosion and increased sedimentation into the channel. It could take 2-3 years for the channel to recover and for effects to decrease to pre-harvest levels. Sediment effects from temporary culvert installation and removal in FR 7325038 would be the small and the same for Alternatives B and C. These effects would not occur in Alternatives A and D.

Cumulative Effects – Water Quality

Roads: The existing road system is already accounted for in road density, road/stream intersections, and road lengths within RHCAs. No road construction is being proposed in the reasonable foreseeable future. There are no cumulative impacts associated with roads.

Temperature: Past vegetation treatments that harvested trees in RHCAs have partially recovered canopy closure from the harvest 20 to 40 years ago. These actions occurred prior to the implementation of PACFISH standards. There are no future vegetation management actions proposed in RHCAs in the Planning Area nor are there any current actions that remove vegetation from RHCAs. The District Personal Use firewood program does not allow the public to cut or remove trees from RHCAs. Eminent trees that pose a risk to personal safety along open roads are cut and left in the RHCA. There are no cumulative effects with other actions that would increase water temperatures.

Sediment: Sediment transport would occur primarily during spring runoff. Oregon State Highway 204 has a large influence on the sediment regime of the channel and there is a low likelihood of being able to distinguish harvest related sedimentation or to detect it during a low probability, high runoff event under either action alternative. Localized short term erosion and sedimentation could occur from pulling logs across the stream channel; these effects are local and short term and would not contribute to cumulative effects temporally or spatially.

There are no other vegetation management actions proposed in the Planning Area that would contribute sediment. The use of snowmobile trails does not contribute sediment because use does not occur during spring thaw. There is no potential for the logging to overlap with snowmobile use because the access and travel management plan restricts winter use to snowmobiles only. The North End Sheep Allotment is currently in non-use and will likely continue in non-use for another two years. Sheep crossings of RHCAs are controlled and movement within the pasture normally occurs in the upland areas, where stream flows do not occur. Since harvest is not proposed within RHCAs, except for Little Phillips Creek, and sheep do not use the Little Phillips Creek area, there is little chance for cumulative effects with the harvest occurring. Impacts associated with grazing use would not likely mix with road use since both occur in the dry season of the year. There would be no measurable cumulative effect to sediment with ongoing or foreseeable future actions.

Water Yield: The relationship between created openings in forested landscapes and changes in water yield and peak flows has been documented by numerous studies. Changes in these parameters would be of concern for aquatic habitat and biota, downstream water users, and for channel morphology. Recent reviews of literature demonstrate that the relationship is highly variable (Stednick 1995, and Scherer 2001). Generally effects are not seen below 15-20 percent equivalent clearcut or treatment acres (ECA or ETA) and in a local study; effects were not seen below 50 percent ECA (Helvey 1995). Grant et al (in press) suggests that increased peakflows could occur at >= 20% "ECA" and that the potential for effects to channel morphology is in the 5-10 year recurrence interval flow ranges.

Umatilla National Forest equivalent treatment acre (ETA) model (Ager and Clifton 2005) was used to evaluate the cumulative effects of harvest through time in this analysis area and to see what change the proposed alternatives would make to this indicator.

Table 3-15 ETA by Alternative

Upper Grande Ronde-Cabin Creek		Existing	Alt. B	Alt. C	Alt. D

		2007	2008	2008	2008
170601041101	Phillips Creek	6.4	6.7%	7.2%	7.0%
170601041102	Gordon Creek	3.7	8.2%	8.0%	3.4%
170601041104	Cabin Creek	3.6	5.0%	5.0%	3.4%
Upper Grande Ronde-Lookingglass					
170601041001	Upper Lookingglass	5.1	5.1%	5.1%	5.1%
170601041002	Little Lookingglass	3.4	3.7%	3.6%	3.4%
170601041003	*Jarboe*	*9.3*	*9.3%*	*9.3%*	*9.3%*
170601041004	Lower Lookingglass	3.2	5.3%	5.0%	4.0%

Includes roads, *Jarboe is not in the AA*

Calculated ETA percentages are well below any criteria for detectible increases in water yield, peakflow, or channel morphology. No effect to these parameters would be expected from any proposed alternative.

Riparian and Fish Habitat

The following is a summary of the analysis found in the hydrologist's report for the Loon Fuels Reduction Project and supplemented with additional information in the EA. The report can be found in the Project Analysis File.

Existing Riparian and Fisheries Habitat Conditions

ESA and Sensitive Listed Species found in the Planning Area: Table 3-16 presents ESA listed and USFS R6 sensitive species known or expected in the project area, or that the project might otherwise potentially affect.

Table 3-16: ESA Listed and R6 Sensitive Fish Species Known or Expected in the Loon Project area

Stock	Classification	Grande Ronde Subbasin	
		Within project Subwatersheds	Outside of project area
Snake River steelhead	ESA Threatened	Yes	Yes
Redband trout	R6 Sensitive	Yes	Yes
Snake River spring/summer Chinook salmon	ESA Threatened	Yes	Yes
Columbia River bull trout	ESA Threatened	Yes	Yes

Steelhead/redband trout *(O. mykiss)* are also a Management Indicator Species (MIS) for the Umatilla National Forest.

Characteristics of Fisheries Habitat: The data describing the existing habitat conditions comes from several sources: USFS aquatic habitat inventories, temperature records from thermographs deployed by USFS and reports of habitat monitoring and inventories from the Oregon State Department of Fish and Wildlife (ODFW). Data on some upland conditions in the watershed (i.e. road density, area harvested or burned) that may affect aquatic habitat are derived from Walla Walla Ranger District records and GIS mapping exercises.

Aquatic habitat inventories using the USDA Forest Service Region 6 stream inventory methods (version 7.5, 1994, and version 2.0, 2000; – Level II protocol), a modified Hankin and Reeves (1988) protocol, were conducted on Lookingglass Creek in 1990 and 1999, Little Lookingglass in 1990 & 1997, Mottet in 1990-91 & 1997-98, Summer in 1992, Eagle Creek in 1992, Little Phillips Creek in 1994. Gordon Creek and both the North and South Forks of Cabin Creek have been surveyed, but that data has not been fully evaluated yet, so only some parts of it can be used here.

Summer season water temperatures have been recorded for several streams in the area using recording hydrothermographs. Some rear-round temperature records are available for Lookingglass Creek. For some streams the only data available is from spot checks with hand-held thermometers.

Other than Little Phillips Creek, streams in the Planning Area are nearly pristine, being located in canyon bottoms having little to no forest management activities. Little Phillips Creek is directly impacted by road management activities associated with Oregon State Highway 204. A portion of Lookingglass and Little Lookingglass Creeks, above the fish hatchery, has a river bottom road used to access the National Forest, Forest Road 63. State Highway 204 is the other river bottom road adjacent to Little Phillips Creek.

Much of the effects analysis will focus on Little Phillips Creek because of the proposed danger tree and fuels treatments proposed within the RHCA. This stream is impacted by State Highway 204 which shares the bottomlands with the stream. The road alignment channelizes the stream. Its flow regime is snow dependent with high flows associated with snow melt. There are springs in the upper 1.5 miles that provide small, perennial flows in the summer. The rest of the stream is intermittent going to subsurface flows in late July to early August. Portions of the stream will have pools and short sections of stream flow where subsurface water comes to the surface. By late August pools become smaller and trapped fish can be found. Alternatives have been developed to look at several ways to manage the RHCA for fuels. Alternative B proposes canopy density control within the RHCA to the stream channel along the perennial portion of the stream (1.3 miles of stream) where the stream is mostly between the road and the unit. The proposed treatments would management the understory, overstory, and surface fuels for fire suppression objectives and for the protection of the WUI. Alternative C and D expand the treatment to include the total highway to the Forest boundary including the intermittent portion of the stream, 5.2 miles of stream. For Alternative C danger trees would be removed where the stream is between the road and the unit and surface fuels treated. Where the road is between the unit and the streams, fuel treatments and stand management would occur within the RHCA to the edge of the road. Alternative D would only remove danger trees along the highway and surface fuel treatments would occur within the RHCA. Redband trout, O. mykiss, occupies the upper reaches of Little Phillips Creek and Snake River steelhead, also O. mykiss, are known to spawn in the lower reaches, below the planning area. There are no physical barriers to keep steelhead from reaching the upper stream occupied by redband.

Water Temperature: Lookinggalss Creek is one of the coldest streams in the Upper Grande Ronde and meets USFWS criteria for bull trout, a cold water fish. Lookingglass lowers the temperature of the Grande Ronde River nearly 10 degrees just downstream from its confluence. Lookingglass Creek provides an important moderating influence on the Grande Ronde that carries many miles down stream. Temperatures for Cabin and Gordon Creeks where measured by mid-day spot checks; Gordon Creek having a single measurement in July. Temperatures in Cabin Creek where 58 degrees, a degree above National Marine Services criteria for steelhead. Little Phillips Creek did not have a record for water temperatures. The lower reaches of Little Phillips Creek has subsurface flows during the mid to late

summer. Pools form with little to no stream flows. The pools are known to trap fish during the summer. Only the upper 1.5 miles historically has year round flows.

Sediment and Turbidity: Though measurements for turbidity do not exist for the streams, observations suggest that background turbidity is not a fisheries concern and it was not identified as a problem for streams in the planning area in the Upper Grande Ronde TMDL.

Substrate: Spawning success is dependent on substrate condition. Wollman pebble counts where used to characterize stream substrate. Measurements indicate that substrate quality in Lookingglass Creek is adequate to maintain fish populations. Though measurements where not recorded for Cabin and Gordon Creeks, stream conditions would be much like Lookingglass because of the lack of roading and low levels of forest management activities that retained RHCA buffers. The substrate in Little Phillips Creek is impacted by fine sediment levels, likely associated with winter plowing and sanding operations, with portions of the stream becoming low quality spawning habitat.

Large Woody Debris: All streams, except Little Phillips Creek, have adequate large wood. Because Little Phillips Creek is adjacent to the highway, large wood that could damage the road or become a traffic hazard is removed. The Oregon Department of Transportation does allow large wood to remain in the stream if it is in a reach that would not cause road damage or is situated in the channel so that flows are not directed toward the road. Even with this, large wood is low because much of the stream is adjacent to the road with the fill channelizing the stream.

Pool Frequency: Most of the streams in the Planning Area would be considered adequate for pools. Notable exceptions are reach one of Little Phillips Creek and reaches one through three of mainstem Lookingglass Creek. In Little Phillips Creek this is probably a result of channelizing the stream alongside of the highway. For Lookingglass Creek, the low pool frequency seems odd, since that section of the creek is probably the part least directly affected by management activities. Lookingglass Creek is unusual in that most of its flow for much of the year comes from numerous large springs in a short reach between the confluences with Summer Creek and Lost Creek. Flow from these springs not only maintains the stream temperatures cold year-round, but also, by maintaining a high summer base flow probably reduces seasonal flow fluctuations. In streams with large seasonal flow fluctuations, the high flows cause scour around or below obstructions. These deeper scoured areas then appear as pools as the flow drops into the summer and fall. In Lookingglass Creek, where flows do not drop as much as in other streams in the area, some of the deeper areas produced by scour may never appear as individual pools.

Pool Habitat Quality: This parameter overlaps with several others (pool depth, large woody debris) and the following evaluations are based on combinations of those parameters, personal observations and professional judgment.

In general, stream reaches closely adjacent to roads have the least escape and hiding cover relying mainly on overhanging brush. Both Little Phillips Creek along Highway 204 and Little Lookingglass along Forest Road 63 have reduced tree cover; Little Phillips for nearly its entire length, Little Lookingglass for about 3 miles. Most other streams in the Planning Area are distant to roads and have PACFISH buffers that protect cover; these streams have adequate cover for fish habitat.

Streambank Conditions: With the exception of Little Phillips Creek, unstable stream banks appear to be rare in these two watersheds (DMC, personal observation). In the case of Little Phillips Creek, highway construction has forced the stream up against the canyon wall, where it is continually eroding, causing raveling of the bank over several lengthy portions.

Environmental Effects to Riparian and Fisheries Habitat

Environmental Effects of Alternative A to Riparian and Fisheries Habitat

Under Alternative A of the Loon project, there would be no new activities proposed. Existing fish habitat trends would continue. Although conditions in Little Phillips Creek are far from ideal for *O. mykiss*, there would be no change in conditions there attributable to Alternative A. Alternative A of the Loon project would tend to maintain the present condition of aquatic species and aquatic habitat in all project area streams and subwatersheds. Alternative A would not impact the viability of *O. mykiss, O. tschawyscha, S. confluentis*, or other aquatic species in project area watersheds.

Environmental Effects of Alternative B to Riparian and Fisheries Habitat

Water Temperature: The only place where shading would be reduced in the planning area is along the perennial portion of Little Phillips Creek reducing shade cover by about 15 percent. Riparian cover would be reduced from its current 55 percent to nearly 40 percent. Little Phillips Creek is a north south trending stream and RHCA trees provide shade primarily at low sun angles. Solar inputs during mid-day hours cause the highest summer water temperatures when overstory trees provide little shade and the sun is aligned with the drainage. The low shrubs covering the channels and on the edge of the stream provides most of the shade during this time of the day. Water temperature could be affected in the perennial portions of units 36 and 37, where the stream is at the base of the unit between the road and the units. Any increase in water temperature caused from the reduction in shade would be immeasurable. Any increase in temperatures, in combination with other factors, would contribute additional physiological stress to the small O. mykiss population in the stream.

Drafting of water could increase water temperatures by reducing stream flows. The proposed design features (see Chapter 2) would prohibit taking water from streams during low flows (less than 5 cfs) and the limited, short term mature of drafting would not affect water temperature.

Sediment, Turbidity, and substrate: There are three situations where the treatments or connected activities would deliver sediment into the stream; the proposed tree removal and fuel reduction in the RHCA of Little Phillips Creek, the temporary culvert placed in Gordon Creek for FR 3725038, and log haul along FR 63 along Little Lookingglass and Lookingglass Creeks.

Impacts to Little Phillips Creek: Sediment would be delivered to the stream by Skyline yarding, tree felling, placement of large wood, and pile burning. Directional felling would reduce the potential for disturbance near the stream channel. The highest direct impact from sediment would come from trees that fall into the channel and their later removal or adjusted placement to protect the highway. There would be approximately 50 danger trees per mile within the RHCA, no more than ten per mile would fall into or across the stream. Any material left for large wood would also become a source of sediment as it settles into the stream. Occasional trees in the channel would be directionally felled and any slippage would loosen soil depositing it into the stream.

Logs removed from the RHCA with the skyline will be with one end suspended. The dragging of the log would cause rutting and exposure of soil within the RHCA and adjacent to the stream. Of particular concern would be the dragging of logs across the stream because ruts would become a direct source of sediment. Loading or felling equipment would be used to move the material in the channel or between the stream and the road whenever possible. This would reduce the impacts from yarding near the stream. Should these trees be removed by helicopter, there would be almost no sediment delivered to the stream. Lifting of logs near the stream could slough a small amount

of sediment into the stream when logs are lifted; it would be immeasurable and not enough to effect fish behavior or feeding success.

The piling of slash and burning of piles would also be a source of sediment; however, design features would reduce this impact. Piles would be no closer than 25 feet to the stream and revegetation and leaving unburned areas to trap sediment would reduce the effect.

Since *O. mykiss* are primarily sight feeders, turbidity produced by increased sediment delivery reduces feeding success. Increased suspended sediment reduces respiratory efficiency by plugging and abrading gill membranes. Increased turbidity also alters other behaviors such as territorialism and migration. Increased fine sediment in the substrate can reduce reproductive success by smothering eggs in redds or making gravel unsuitable for spawning. These impacts would be short-term (at the time of the activity) occurring at a time when fish can move away from the disturbance or when the channel is dry. Sediment delivery into Little Phillips Creek from this activity would be small nearly immeasurable but in addition to that introduced by traction sand and snowplowing of Highway 204 and would add a small amount of stress to an already stressed population of *O mykiss* in Little Phillips Creek..

Impacts to Gordon Creek: A temporary culvert would be installed on FR 3725038 in Gordon Creek. The installation and removal would produce a brief sediment flush, but because the stream here is of very low gradient, most, perhaps all, of this sediment, along with any from the road surface, would precipitate before reaching the fish-bearing parts of Gordon Creek. Sediment effects are unlikely to be sufficient to alter feeding, spawning, or sheltering activities of fish, or to alter pool quality or frequency, or width/depth ratios.

Impacts to the Lookingglass and Little Lookingglass Creek: Timber would be hauled over FR 6300 crossing Mottet Creek and closely along Lookingglass and Little Lookingglass Creeks for about three miles. This is an open road that receives considerable public use. In the unlikely event that log hauling were conducted under very wet conditions, the pumping action of the heavy truck traffic would suspend fine sediment in water running off of the road surface, contributing sediment to Lookingglass and Little Lookingglass Creeks. Most of the haul over this stretch of road would be during the dry season when there would be no water leaving the road. Occasional wet weather haul would occur during summer rain storms or early spring. Fine sediment produced by the truck traffic over the wet, gravel surfaced road would run off the road into Little Lookingglass or Lookingglass Creek containing ESA listed bull trout, chinook salmon, and steelhead habitat. Road use rules would require haul to be suspended if there is a continual discharge from the road surface that produces a visually evident increase in turbidity downstream. Sediment sufficient to produce a visually evident increase in turbidity would also be sufficient to cause adverse effects to fish, so road use rules alone are not sufficient to prevent adverse effects to fish. It might not rain during timber haul, or if it did, it might not be sufficient to produce road surface runoff, and in some places there is some buffering capacity between the road and the stream, so it is unlikely that substantial quantities of sediment from this source would enter the stream. These three miles of streams also have too steep of a gradient to provide rearing or spawning habitat; it is migratory route to habitat upstream. Fish would pass through any turbidity or be deterred in the unlikely event that turbidity would reach those levels.

Approximately 3 miles of Forest road 6300 along Lookingglass and Little Lookingglass Creek that would not otherwise have been plowed, could be plowed for log haul for the Loon timber sale. Since these portions of the streams are directly adjacent to the road, there is a small possibility that some snow and accompanying sand or soil could be plowed into the stream channel. These would

be very small amounts, since it is in the interest of road managers to maintain the gravel surface on the road insofar as possible. To that end, snowplows are required to use "shoes" (a kind of spacer under the blade) to prevent the blade from directly scraping the road surface, but because the road surfaces are not perfectly flat, some small amounts of gravel or soil will usually be removed with the snow. Project design criteria would require equipment operators to plow snow away from the stream channel, but some parts of Road 63 closely parallel Little Lookingglass Creek for a very long distance, and it may not always be possible to do this. Therefore, snow plowing this road carries a small risk of introducing a small amount of sediment into Lookingglass or Little Lookingglass Creeks.

Flows in Lookingglass and Little Lookingglass Creeks are much stronger than those of Little Phillips Creek, particularly at times likely to have road surface runoff or require snowplowing, so it is unlikely that there would be sediment effects sufficient to alter feeding, spawning, or sheltering activities of the three species of listed fish in the Lookingglass system, or to alter pool quality or frequency, or width/depth ratios.

Large Wood: Little Phillips Creek would be the only area impacted for large wood recruitment. The proposed harvest within the RHCA would remove wood that could have become a part of the stream in Units 36 and 37, the perennial portion of the stream. Project design features would allow a portion of the material to be felled and positioned in the stream where it would not damage the road. There are a few small stretches of the stream where the channel is not immediately adjacent to the toe slope of the road fill, and where in-channel large woody debris would not represent a risk to the highway, these areas represent only a very small part of the length of the stream. These small sections of the stream may reach PACFISH objectives for large wood but much of the stream length would not because of highway protection needs. The presence of Highway 204 on the floodplain of Little Phillips Creek has had substantial effects on woody debris frequency in that the Oregon State Highway Department removes trees or logs that fall into Little Phillips Creek where it is directly adjacent to the highway or in places that would cause damage to the highway. Highway protection needs would continue to remove large wood from the stream making attainment of PACFISH RMOs difficult. Highway management activities alone would have an overwhelming effect on the woody debris frequency in Little Phillips Creek, making the Loon project nearly meaningless in terms of woody debris frequency. Although large woody debris component of habitat normally supports spawning, feeding, and sheltering activities of fish, that habitat component in Little Phillips Creek is already degraded to the point of near non-existence the placement of danger trees into the stream would improve that condition.

No other RHCAs in the Planning Area would have timber harvest or fuel treatments. The occasional use of fire to reduce fuels would not have ignitions in an RHCA, however fire would be allowed to creep into the RHCA. Danger trees cut in other RHCAs would be cut and left. Should a creeping fire burn out a snag or tree it would become large wood should it fall into a stream.

The treatment for fuel reduction by tree canopy and surface fuels removal would also remove trees that would have become a part of the riparian area though not in-stream wood. A portion of riparian function associated with large down wood would be lost. Design feature would retain a portion, but fuel reduction needs for protection of the WUI would take precedence.

Pool Habitat, Frequency and Depth:

Little Phillips Creek: Pool habitat in Little Phillips Creek has been compromised by the presence of highway 204 closely adjacent to the stream. Highway management affects pool habitat by: 1) removal of pool forming large woody debris, 2) Introducing sediment (from traction sand) that

can fill or partially fill pools, and fill intersticial spaces in pool substrate, reducing escape and hiding cover. Effects on habitat depend on the balance between rates of sediment introduction to the stream and sediment transportation through the system. In the higher gradient parts of Little Phillips Creek, sediment is transported rapidly and then deposited in the lower gradient reaches.

Alternative B is likely to introduce some additional sediment to Little Phillips Creek from soil exposed by timber felling and yarding and other timber harvest activities near stream channels. Quantities would likely be small, but could potentially concentrate in pools in lower gradient reaches. Project Design Features would require riparian and streamside harvest to occur when water is high so that fish could move away from the activity. Sediment would likely be carried out of the upper reaches where Units 36 and 37 are located. Should sediment be deposited whiles flows decrease, spawning gravels of redband could be impacted by filling interstitial spaces in the substrate. The high flows would allow the fish to move away from the activity however when water decrease any sediment trapped in the upper reaches would reduce escape and hiding habitat, alter the type of invertebrate fauna available as forage, and reduce the quality of spawning gravel for the year. Renewed flows would flush this from the system. The mixed gradient stream would likely trap sediment from the project before it reaches the spawning areas of steelhead outside the project boundary. High flows would likely flush this from the system the following year.

Gordon Creek: Sediment generated from the temporary culvert installation and removal would not reach fish bearing sections of the creek and not impact pools or fish habitat. There is no other Riparian or stream related activity that would occur in the Gordon or Cabin Creek watersheds.

Lookingglass Creek: Since all project activities in the Lookingglass watershed except for water drafting and parts of the log haul are outside of Pacfish RHCAs, there is little opportunity for project activities to affect pool habitat. Although Log haul over Forest road 6300 could introduce additional sediment into Lookingglass and Little Lookingglass Creeks, the flow in these streams makes it unlikely that the amount of sediment introduced would be enough to degrade pool habitat sufficiently to alter feeding, spawning or sheltering activities of fish.

Streambank conditions: Stream bank stability of Little Phillips Creek would be changed by removal of vegetation. Removal of trees on the stream bank would reduce stream bank stability by:

(1) When trees are removed by having to cross the stream channel or be taken out of the channel, stream banks would break down and damage stabilizing vegetation would occur. This can be very confined to the log drag or extensive to the length of the log if it rolls as it is yarded from the channel. Erosion measures requiring seeding with native seed would reduce the impact of bare soil and loss of stability.
(2) As live trees are harvested from the stream bank, their roots die, decompose, and eventually lose their stabilizing capacity. The stabilizing function of roots of harvested trees may eventually be replaced by growth of other plant roots in the area, but there would be an interim period of reduced stability.
(3) The burning of slash piles and associated creep could kill vegetation within a few feet of the stream channel of Little Phillips Creek. This would be short term and the vegetation would resprout. Burn intensity of a creeping fire would be low, burning the tops of plants but leaving live roots that would respout. Exposed soil would be revegetated using native seed.

This reduction of stream bank stability would be in addition to the already high levels of unstable streambank of this stream caused by channelization.

Loon project activities would not entail work on or close to stream banks of other streams except for installation of a culvert in the headwaters of Gordon Creek. The culvert would be temporary and the installation would be followed by removal. The culvert is located where a culvert was previously removed leaving a highly altered stream bank. Other than in Little Phillips Creek, the Loon project would not produce any additional stream bank instability.

Summary of Effects of Alternative B to Riparian and Fisheries habitat: Because fish in Little Phillips Creek are stressed, likely living near the limit of their tolerance for a number of environmental factors (low summer stream flows, sediment/substrate, large woody debris frequency, summer passage barriers, pool quality, stream bank conditions, floodplain connectivity, and probably temperature) they are likely vulnerable to small environmental perturbations like those caused by the action. The effect to the fish would be reduced through the use of design features that would have the operation occur when there is enough stream flow to allow the fish to move away from the activity. Most of these effects are small lasting a week to a month in time but when combined with the existing condition would cause some behavior responses.

The felling and yarding of trees near the stream channel would disturb the normal feeding and sheltering activities and because of the early spring timing for the activity would cause fish to move off any spawning areas. Trees felled or repositioned into the stream could kill some fish. Spring flows would likely move sediment out of this upper spawning reach but the low gradient areas could collect sediment and impact pool habitat, width/depth ratios, and substrate. The thinning of the riparian tree overstory to reduce potential crown fire would cause a small, immeasurable increase in temperature during summer low flows. The felling and removal of trees inside the stream channel would breakdown small portions of the bank by the dragging of logs. It would not be persistent and would heal within the first year. Bank stability provided by tree roots would be reduced but remaining trees would replace the mat from intermingled roots. The design features moves the activity from happening during the summer when stress would be highest and the expected effects would be short-term, many in the spring and lasting one year. The activity would likely reduce successful spawning and rearing numbers of *Oncorhynchus mykiss* in Little Phillips Creek, but because of design features and short duration of impacts activities would not reduce the Little Phillips Creek population to a point of non-viability.

Because *Oncorhynchus mykiss* are widely distributed throughout the Forest and the Pacific Northwest, with strongholds for at least the resident form (redband), and Little Phillips represents only a very, very small part of the population, this would not meaningfully reduce the viability of the species in the region.

Fish in other streams in the project area are less stressed, and except for one culvert installation, log haul, and water drafting, project activities there are outside of RHCA's and not likely to produce additional stress to fish. The remainder of Alternative B would not reduce the viability of bull trout, Chinook salmon, redband trout, or Steelhead trout in the Lookingglass watershed, or in the Grande Ronde River – Cabin Creek watershed outside of Little Phillips Creek.

Environmental Effects of Alternative C to Riparian and Fisheries Habitat

Impacts to fisheries habitat would be similar to that for Alternative B. The difference between Alternative B and C is the amount and type of treatments proposed along Highway 204 within the Little Phillips RHCA. Alternative C treats approximately 5.2 miles of Highway 204 from FR 31 to the Forest boundary. This portion of highway is within the Little Phillips Creek RHCA.

The only place where fuels management for canopy would occur is where the stream is on the other side of the unit. This does not effect large wood recruitment because highway maintenance would remove

these trees when they fall. Trees from this portion of the unit do not provide a source of large wood. This portion of Little Phillips Creek is also the most channelized and has several tunnels made through the rock for the stream. Low shrubs are also present where the stream is next to the highway and goes dry for the summer with few pools. The tree removal would not change summer flows, temperature, or provide a source of sediment. Fish habitat would not be changed. In portions of Little Phillips Creek that dry or go subsurface during summer months, shade is not the controlling factor on water temperature in these reaches.

Where the stream is between the unit and road there is potential that activities, though reduced would still cause additional stress to the fish. This is predominately the perennial portion of Little Phillips Creek. Tree cutting and removal would be for danger trees only followed by hand piling of small surface fuels. Since the canopy would not be reduced as part of the fuel reduction, impact to shade would be reduced and confined to the danger tree removal of about 50 trees per mile, 50 percent are dead, less than 5 percent reduction in shade canopy. The removal and repositioning of trees felled into the stream would still be a source of sediment. In the lower reaches where canopy thinning would occur the canopy would be reduced about 15 percent; this is the intermittent portion of the stream where the road is between the stream and the unit. Like Alternative B the work would occur when fish can move out of the activity area in the spring. The impacts would be temporary and short term, much less than Alternative B but still would impact behaviors and spawning. Alternative C would temporarily reduce spawning success for one year in Little Phillips Creek because of the felling and other activity near the channel in the spring. These activities would not reduce the Little Phillips Creek population to a point of non-viability because the design features implemented for harvest and fuel treatment activities reduces the impacts. Because *Oncorhynchus mykiss* is widely distributed throughout the Forest and the Pacific Northwest, with strongholds for at least the resident form, and Little Phillips represents only a very, very small part of the population, implementing Alternative C would not measurablely reduce the viability of the species in the region.

Outside of Little Phillips Creek the impacts to fisheries would be the same as that disclosed for Alternative B. Activities proposed in Alternative C would not reduce the viability of fish in other streams in project area watersheds.

Environmental Effects of Alternative D to Riparian and Fisheries Habitat

This alternative differs from Alternative C by not proposing canopy reduction or timber removal within the Little Phillips Creek RHCA. This alternative would have the lowest impacts to fisheries habitat because the only activities proposed in Little Phillips Creek would be danger felling and piling of surface fuels. Danger trees would be cut and left except where they pose a safety concern to the highway through collisions or damage the road. Danger trees would be removed between the stream and the road. In other areas, down trees would be evaluated where they are adjacent to the road and removed if they an obstacle for collisions. Removal of trees would not require dragging logs across the stream reducing sediment input. The only source of sediment would come from the placement or removal of large wood in the channel; this is not expected to be a measurable impact from about 10 trees per mile.

Where the stream is between the unit and road there is potential that activities, though further reduced than Alternative C would still cause additional stress to the fish in the perennial portion of Little Phillips Creek. Tree cutting and removal would be for danger trees only followed by hand piling of small surface fuels. Since the canopy would not be reduced as part of the fuel reduction, impact to shade would be reduced and confined to the danger tree removal of about 50 trees per mile, 50 percent are dead, less than a 5 percent reduction in shade canopy for the length of the highway. There would be no measurable impact to stream temperature. The removal and repositioning of trees felled into the stream

would still be a source of sediment. Like the other alternatives the cutting would occur when fish can move out of the activity area in the spring. Any removal or repositioning would be temporary and short term, less than Alternative C but still would impact behaviors and spawning. Alternative D would temporarily reduce spawning success for one year in Little Phillips Creek because of the felling and other activity near the channel in the spring. These activities would not reduce the Little Phillips Creek population to a point of non-viability because the design features implemented for harvest and fuel treatment activities reduces the impacts. Because *Oncorhynchus mykiss* is widely distributed throughout the Forest and the Pacific Northwest, with strongholds for at least the resident form (redband), and Little Phillips represents only a very, very small part of the population, implementing Alternative D would not measurablely reduce the viability of the species in the region.

Outside of Little Phillips Creek the impacts to fisheries would be the same as that disclosed for Alternative B. Activities proposed in Alternative C would not reduce the viability of fish in other streams in project area watersheds.

Cumulative Effects – *Riparian and Fisheries Habitat*

Other than Little Phillips Creek the action alternatives do not propose vegetation management in RHCAs. There area no other Forest Service actions proposed in Little Phillips Creek nor are any ongoing actions; there would be no cumulative effects. Impacts associated with the use of Highway 204 have been considered with direct effects.

PACFISH Forest plan Amendment: The Forest Plan amendment recognizes the impacts of Oregon Highway 204 on the ability of Little Phillips Creek to attain PACFISH RMOs. Road sanding for winter driving and the removal of large wood to protect the highway would continue to occur. Where the road has channelized the stream, large wood and tree shade has been reduced. PACFISH does not put a cessation to activities in RHCAs, it provides direction for protecting or accomplishing RMOs. The proposed timber harvest and vegetation management in the Little Phillips Creek RHCA would not occur to attain or maintain RMOs. Public safety is the primary reason for entering the RHCA for both traffic concerns and fuels reduction treatments to protect values in the Palmer Valley Wildland Urban Interface. The forest plan amendment changes the management focus to public and fire fighter safety in only the Little Phillips Creek RHCA, no other RHCAs on the Forest would be changed. RMOs are not changed but would still be accomplished where they are compatible with the management of the highway. There is no change in RHCA widths, the 300 feet for fish bearing stream still applies. The direction to attain RMOs in Little Phillips Creek is removed because of current conditions and the inability to meet or maintain RMOs. The direction of management of RMOs in Little Phillips Creek is short-term, it would be in place until the Forest Plan is revised and the Forest is currently revising the plan.

Even though the amendment does not provide a focus to attain RMOs is would still protect existing values and conditions while improving RMOs where possible. There are portions of the stream where large wood can be left for fisheries habitat. The use of a timber sale to cut and remove trees is compatible with using a service contract to accomplish the same action; it is efficient to accomplish the work while the timber sale is active in the area. The impacts would be the same to fisheries habitat no matter how the trees are cut and removed.

The amendment does not change goals, objectives, or outputs of the Forest Plan. The goals and objectives for the RHCA would still be the same and RMOs would be accomplished where they are compatible with road safety and protection needs. The RHCA would not be available for scheduled

harvest. Timber values would be associated as an outcome from treatments for reducing fuels and creating safe highway conditions.

Since the Forest Plan amendment would allow timber harvest to occur in the RHCA special design features have been incorporated into the project to protect and reduce the impacts to fish and their habitat. Adverse effects to riparian and aquatic habitat would be reduced as well as the risk to detrimental impacts to anadromous fish. The intent of PACFISH to protect fisheries habitat and fish species is accomplished by performing the work at a time when there is enough water in the stream for fish to move away and if sediment is delivered into the stream there would be enough flow to disperse it. The District will work with the Oregon Department of Transportation to locate areas where large wood from cutting danger trees can be placed into the stream and locate places where trees could be planted. Where the unit provides a source for large wood for the stream, when the stream is between the road and the unit, the alternatives provide different degrees of protection in the RHCA so future sources of large wood are provided. Alternative C would not reduce the RHCA overstory when the stream is between the unit and the road; only danger trees would be cut and removed. Alternative D would only cut the danger trees and remove those that are a hazard to traffic or could damage the road. Of all alternatives, Alternative D would leave the most down large wood within the Little Phillips RHCA, even though the small fuels would be hand piled.

Threatened, Endangered, and Sensitive Aquatic Species

Determinations of effects of Alternative A to Proposed, Endangered, Threatened and Sensitive (PETS) fish species

There is no mechanism for direct or indirect effects to occur to ESA listed species of fish or to USFS R6 sensitive fish or to their habitat because no new activities would occur. Therefore there would be *no effect* to Proposed, Endangered, Threatened or Sensitive Fish species.

Determinations of effects of Alternative B, C, and D to Proposed, Endangered, Threatened and Sensitive (PETS) fish species

This project would have no effect on Snake River fall Chinook salmon, middle Columbia River steelhead trout, or Coho Salmon, because these species and their habitat are not present in the streams or watersheds potentially affected by the project, or their habitat is sufficiently far downstream, well outside of the project area that potential effects would be attenuated to a level of insignificance. For the same reason, the project would have no impact on margined sculpin, pacific lamprey, or westslope cutthroat trout.

Snake River spring/summer Chinook salmon and Columbia River Bull trout trout inhabit some project area watersheds. Redband trout and Snake River steelhead occupy all of the Project area watersheds.

Rational for effects determinations for these species and their habitat has been presented in the environmental consequences section of this report. In summary, All alternatives are likely to cause incidental harm to individuals and would degrade shade, water quality (temperature, sediment), and substrate components of aquatic habitat in Little Phillips Creek. The Loon project May Affect and is Likely to Adversely Affect Snake River Steelhead in Little Phillips Creek. Since redband trout are the same species as Snake River Steelhead and both life history forms inhabit Little Phillips Creek, the Loon project May impact individuals or habitat of redband trout, it will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Risk is much less in other streams in project area watersheds, but since the risk, particularly that related to wet weather log haul and water drafting for dust abatement, cannot be completely eliminated, the Loon project May Affect but is not Likely to Adversely Affect Snake River Spring/Summer Chinook salmon, or Columbia River bull trout. In streams other than Little Phillips Creek, the Loon project is not likely to adversely affect Snake River steelhead trout.

Wildlife Habitat

The following is a summary of the analysis found in the wildlife biologist's report for the Loon Fuels Reduction Project and supplemented with additional information in the EA. The report can be found in the Project Analysis File. The quantity and quality of wildlife habitat was primarily assessed using a Geographic Information System (GIS), district records, and field reviews. Vegetation information used in this evaluation was obtained from the project Silviculturist or from GIS databases. The Loon planning area stretches south from Jubilee Lake to the Tollgate highway near Andies Ridge. Generally the scale of analysis for wildlife is the planning area, however in many instances a larger area was considered and those scales are identified in the appropriate sections.

The Wildlife Analysis is broken up into sections representing various components: Old Forest Habitat, Management Indicator Species, Management Indicator Species Associated with Dead Wood Habitat, Landbirds and Threatened, Endangered, Northern goshawk, and Sensitive Wildlife Species. The existing condition will be disclosed followed by the environmental consequences for each section.

Old Forest Habitat

Existing Condition: The Forest Plan has allocated two Dedicated Old Growth (C1) areas within the planning, area: #0725 on Eagle Creek and #0795 on Gordon Creek. These stands are considered suitable pileated woodpecker and marten habitat. Three C2 – Managed Old Growth stands located near #0725 currently have an Understory Reinitiation structural stage.

Analysis of forest structural stages indicates the late and old stand structure (LOS) occurs on about 3800 acres or 20% of the forested portions of the planning area. These stands are small, but well distributed throughout the planning area except for the area just south of Luger Spring where the forest acquired two full sections of logged private land about 20 years ago.

Umatilla National Forest Plan Amendment #11 established interim riparian, ecosystem, and wildlife standards for timber sales (the Eastside Screens) (USDA 1995). It requires that certain categories of timber sales be screened to evaluate their potential impact on riparian habitat, historical vegetation patterns, and wildlife fragmentation and connectivity. The Interim Wildlife Standard (wildlife screen) restricts the harvest of timber in stands classified as late or old structure (LOS) if the amount of LOS in the area is below the historic range.

Analysis of structural stages indicates the amount of LOS is below the historic range of variability with the exception of old single, story structure in the moist forest (Silviculture Report). There is particularly little LOS in the dry upland forest area (1 to 2 percent). Harvest in LOS is not proposed in the Loon planning area.

Outside of LOS, many types of timber sale activities are permissible, however "remnant late and old seral and/or structural live trees greater than or equal to 21 inches in diameter" must be maintained; and manipulation of vegetative structure not meeting LOS standards should occur in such a way that

conditions are moved toward LOS structure.

Connectivity between blocks of late and old structure (LOS) stands as well as C1, Dedicated Old Growth has been assessed for the planning area. Connective habitat does not necessarily need to meet the same description of old forest habitat, but provides "free movement" between LOS stands for various wildlife species associated with old forest conditions.

For the majority of the planning area, LOS stands and C1 areas are connected to each other with stands of variable widths (greater than 400 feet) and attached with 2 or more different connections. Connective stands are primarily in the Young Forest Multi-Strata, Young Forest Single-Stratum, Stem Exclusion, and Understory Reinitiation structural stages. The least connected areas include non forested areas, unhealthy stands, and areas that have not grown back since the last timber harvest.

Environmental Consequences of Alternative A - No Action to Old Forest Habitat

Fire suppression would continue the trend towards overstocked, unproductive stands with limited value as wildlife habitat for old forest dependant wildlife species. Old forest in the warm dry environment would continue to develop into multi-storied, overstocked stands with encroaching fir, further reducing the amount of dry site Old Forest Single Structure below the historic range of variability.

Over time, stands in early successional stages would develop habitat characteristics that would result in additional connective corridors. At the same time, wildland fire, tree disease, or insect infestations could reduce old forest and connectivity corridors in the future.

Environmental Consequences Common to All Action Alternatives to Old Forest Habitat

Harvest prescriptions include thinning, improvement cut, patch cuts, and salvage. Timber harvest and fuels reduction would improve the health and resilience of stands that are overstocked and/or developing heavy fuels. Many areas that would be thinned are currently unproductive stands having a single story, stem exclusion structure. Reduced stocking levels would decrease stress and associated insect/disease susceptibility on the overstory trees that remain. Harvest treatments would aid in attaining future old forest structure more quickly than if the stands were left in their current condition.

The existing condition of the Dedicated Old Growth stands would not change because no activities would occur within Management Areas C1 or C2.

The existing condition and amount of old forest structure (LOS) also would not change, and the average number and distribution of existing large trees (> 21 inches dbh) would not change. No timber harvest is proposed in old forest stands, and the harvest treatments would not reduce the number of live trees greater than or equal to 21 inches in diameter.

Connectivity between old forest stands would be maintained at current levels in the short term (<20 years). These corridors would allow the free movement of various wildlife species through different stand types in the analysis area. No harvest is proposed in these areas. Over time, stands in early successional stages would develop habitat characteristics that would result in additional connective corridors. At the same time, wildland fire, tree disease, or insect infestations could reduce old forest and connectivity corridors in the future.

All units will maintain snags and down wood in excess of Forest Plan standards. The healthiest large trees and the soundest large snags will remain as the building blocks for future stand and habitat

development. In units where fuels reduction is a priority, dead trees will be removed but all snags ≥ 21" dbh would be retained unless they need to be cut for safety.

Cumulative Effects to Old Forest Habitat

Past and ongoing fire exclusion has increased fuel loads and the associated hazard of losing additional old forest structure and fragmenting travel corridors because of uncharacteristically large-scale, high severity fire. The proposed fuel treatments would reduce the risk of losing existing old forest in the area to large-scale fire. No other past, ongoing, or proposed activities would affect old forest habitat in this area.

Environmental Consequences Unique to Alternative B to Old Forest Habitat

Harvest and fuels treatment is proposed on 1923 acres or about 9.5 % of the entire planning area. None of these stands are classified as old forest (LOS), but one (unit 4) is within an old forest connectivity corridor. Harvest in Unit 4 would not change its value as a connective corridor, because of the large number of trees > 21" dbh that would be retained.

Stand health, vigor, and resilience would be improved on 1800 acres. Thinning would occur on 484 acres, and improvement harvest would occur on 1245 acres, which will decrease stem exclusion and move the stands towards an Understory Reinitiation and eventually old forest condition. Patch cuts will improve stand health and increase western larch regeneration on 75 acres. Additional fuel reduction on 120 acres will include salvaging some dead and dying trees, but none greater than or equal to 21"dbh.

Environmental Consequences Unique to Alternative C to Old Forest Habitat

Harvesting is not proposed within Dedicated Old Growth, LOS or in connectivity corridors. Harvest and fuels treatment is proposed on 2166 acres, which equates to about 11% of the planning area, slightly more than Alternative B. Some units were dropped or reduced in size to protect resources, while others were enlarged to better treat fuels.

Stand health, vigor, and resilience would be improved on slightly more acres (2,040 acres). Tree thinning would occur on 369 acres. Improvement harvest would occur on 1652 acres, which will decrease stem exclusion and move these stands towards an Understory Reinitiation and eventually old forest condition. Patch cuts would improve stand health and increase western larch regeneration on 25 acres. Additional fuel reduction on 120 acres will include salvaging some dead and dying trees, but none greater than or equal to 21"dbh.

Environmental Consequences Unique to Alternative D to Old Forest Habitat

No treatments are proposed within Dedicated Old Growth, LOS or in connectivity corridors.

The primary objective in all of the units is fuels reduction. Understory thinning would occur in 8 fuel reduction units, salvage harvest of dead trees and/or biomass material would occur on 2 fuel reduction units, and Improvement cuts would occur on 3 fuel reduction units. All units would also require mastication, underburning, jackpot burning, or pile burning.

Alternative D would treat 1196 acres, about 6% of the planning area and about half the acres shown for Alternative C. Stand health, vigor, and resilience would be improved on the least number of acres (1075 acres).

Management Indicator species

Rocky Mountain Elk

Rocky Mountain elk was selected as an indicator species in the Forest Plan to represent general forest habitat and winter ranges. The Loon planning area falls within Wenaha Game Management Unit managed by Oregon Department of Fish and Wildlife (ODFW). The Management Objectives (MO) for elk in the Wenaha unit is 4,250 elk. Over the past 10 years, winter elk census numbers have remained about 60% below the state MO. This may be due to low calf recruitment noted in northeastern Oregon herds.

Big Game Cover: A mosaic of forest successional stages is distributed throughout the planning area, providing cover and forage for elk. Satisfactory cover[1] provides hiding, thermal, and escape cover for elk. Marginal cover also provides hiding and escape cover, but tree canopy may be less dense and often provides less security. Table 3-17 displays the existing condition and Forest Plan standards for cover.

Forage for Big Game: The Loon planning area is used by elk in the summer, a time of storing reserves for winter and a time for the growth and development of calves. Forage quality for game animals has not been assessed in this area for many years. Although past timber harvest may have provided short term increases in forage, the amount and quality is largely controlled by the year to year weather (Wisdom et al. 2005).

Roads: The quality of elk habitat is influenced by the presence of humans, which causes animal stress and hunting vulnerability. This is primarily associated with motorized use of open roads and the availability of cover. Elk have been found to select habitats preferentially based on increasing distance from open roads (Rowland et al. 2000). Vulnerability and hunting mortality have been found to be higher in forested stands with greater road densities and less hiding cover (Weber et al. 2000). Many roads in the planning area have been closed to motorized vehicles since the early 1990's such that the potential for road disturbance to big game has declined in recent years. Open road densities in the Loon planning area are relatively low, generally 1 to 2 miles per square mile. This is within the desired condition of an average of 2 miles per square mile or less Forest-wide (USDA 1990).

Habitat Effectiveness Index (HEI): The elk habitat effectiveness model (HEI) is used to predict the influence of forest management on elk and other big game species. The model uses the distribution of cover and forage areas, cover quality, and road factors to help indicate how effective an area will be in supporting big game (Thomas et al. 1988). It is intended to be a relative measure of effectiveness, and does not consider many other factors such as weather, predation, disease, nutrition, hunting, and harvest.

Two major Forest Plan Management Areas in the Loon planning area were assessed using HEI. The majority of the planning area is made up of E2 – Timber Management and Big Game (60%) and C4 – Wildlife Habitat (28%).

- Management Area C4, Wildlife Habitat

  The HEI value for C4 is .66, which is above the Forest Plan minimum standard of .60. Total cover is currently 65% with 17% in a satisfactory condition (>70% canopy closure). Satisfactory cover is only 2% above the minimum standard of 15%.

- Management Area E2, Timber and Big Game

[1] Satisfactory cover is defined as stands of coniferous trees 40 feet or more in height with an average crown closure of 70 percent or more. Marginal cover consists of trees that are 10 or more feet high with an average canopy closure of at least 40 percent.

The HEI value for E2 is .58, which is above the Forest Plan standard of .45. Total cover is currently 52%, with 13% in a satisfactory condition (>70% canopy closure). Satisfactory cover is 3% above the minimum standard of 10%.

Environmental Consequences of No Action to Rocky Mountain Elk

The amount and distribution of elk cover and forage would not likely change in the short-term (20 years). Over the long-term (beyond 20 years) given current fire suppression policies, stands would continue to develop a multistory structure, increasing the amount of satisfactory, marginal, and total cover above what is currently present. The development of more hiding and thermal cover would be beneficial to elk. The quality and amount of elk forage could slightly decrease as more stands close in.

Road densities are not expected to change so human disturbance factors should remain static. HEI values may improve over the long term due to increases in satisfactory cover.

Environmental Consequences of All Action Alternatives to Rocky Mountain Elk

The following changes to cover and HEI were determined for each alternative.

Table 3-17. Forest Plan standards and alternative comparison for Rocky Mountain elk.

Indicator of Response	Minimum Plan Standard	Alt A	Alt B	Alt C	Alt D
C4 Percent Satisfactory Cover	15	17	17	17	17
C4 Percent Total Cover	30	65	63	63	63
C4 Habitat Effectiveness Index (HEI)	60	66	66	66	66
E2 Percent Satisfactory Cover	10	13	10	10	12
E2 Percent Total Cover	30	52	46	48	51
E2 Habitat Effectiveness Index (HEI)	45	58	57	57	58

Management Area C4, Wildlife Habitat

All alternatives would stay above forest plan standards for elk in Management Area C4. Open road densities would not change, satisfactory cover would not be reduced, and the Habitat Effectiveness Index value does not change under any alternative. Total cover would be slightly reduced to 63%, which is well above the Forest Plan standard of 30%.

Management Area E2, Timber and Big Game

All alternatives would meet forest plan standards for elk in Management Area E2. Open road densities would not change, but cover would be slightly reduced. Some of the thinning units would cause satisfactory cover to be converted to marginal cover. Other units would no longer provide adequate elk cover. Alternatives B and C would reduce satisfactory cover down to the minimum standard of 10%.

The Habitat Effectiveness Index value changes by only 1 point in Alternatives B and C, and does not change in Alternative D (Table 3-17). Overall, the effects of Alternative D to elk are minor.

Elk may have slightly less security during hunting season due to the reduction in cover. Some closed roads would be opened temporarily for harvest and fuels activities; however they would remain closed to the public. Use of temporarily opened roads together with treatment activities could cause a short-term disturbance to elk and other big game. Often elk will avoid work areas only during periods of human activity, and return to use stands at night after work has ceased.

Forage for big game: Jackpot burning and mechanical fuels treatments could temporarily remove some shrubs, grasses, and seedlings from the understory in treated stands. Within a year or two this vegetation would re-occupy the area and would likely provide higher forage quality for elk. Mechanical fuels treatments would encourage new growth of grasses and shrubs, and improve elk mobility in stands that currently contain heavy fuel loads.

Summary of Impacts: Elk and deer populations would respond in various ways to potential habitat changes, however many other factors influence numbers, such as weather, predation, and forage nutrition quality on winter ranges. In general, little change in numbers would be expected with the current state deer and elk management strategies.

Cumulative Effects to Rocky Mountain Elk

Past timber harvest and roads has occurred throughout the area, which is reflected in the existing condition. Two full sections south of Luger Spring were privately logged prior to acquisition by the Forest Service. All of the proposed harvest and fuels treatment units have been previously entered.

Ongoing activities that could affect elk forage and elk behavior include sheep grazing, OHV use, and non-commercial thinning of young stands. Typical forest recreation uses occur in the area such as hunting, hiking, berry picking, and hunting. These activities would not occur at the same time as the logging nor do they occur over an extended period of time. They are short duration, from several minutes to hours, and would not have cumulative effects on behavior.

The existence of roads and rock pits are the main soil disturbance that leads to establishment of weeds that can reduce forage resources for elk. Domestic livestock can exacerbate weed spread. Other carriers include various wildlife, people and their animal companions, and vehicles. Past efforts to control weed sites have been successful and monitoring and treatments will continue. Controls to reduce or eliminate potential noxious weed spread via logging operations would be in place. Any new weed sites would be treated through the forest weed program.

Cumulatively the effects of proposed activities in combination with other existing and potential future effects are not expected to have negative impacts to Rocky Mountain elk and other big game species.

Management Indicator Species: American Marten

The American marten was selected as an indicator species in the Forest Plan to represent complex mature and old growth stands. Preferred habitat for the marten consists of high elevation (> 4000') stands of dense conifer and down wood often associated with streams. The historic population density and distribution of marten is unknown, but they probably occurred in the area in low numbers. Past timber harvesting may have removed a significant portion of what was former marten habitat. A marten

survey conducted in 2006 established the presence of at least one marten about 5 miles northeast of the planning area in the Wenaha – Tucannon Wilderness.

Within the Loon planning area, dense, mature conifer habitat near streams is mainly found near Jubilee Lake and along upper reaches of Lookingglass Creek, Gordon, and Cabin Creeks. No activities are proposed in these kinds of stands; therefore, no further analysis of environmental effects will occur for American marten.

Management Indicator Species Associated with Dead Wood Habitat

Dead Wood Habitat and DecAID: Dead wood includes standing dead trees or "snags" and down wood or logs. Bird and mammal species rely on dead wood for dens, nests, resting, roosting, and/or feeding on animals and organisms that use dead wood for all or parts of their life cycle. In forest environments, about 93 wildlife species utilize snags and about 86 vertebrate wildlife species are associated with down wood (Rose et al. 2001). Dead wood comes in all sizes (diameters) and goes through a decay process from hard to soft, ultimately ending up on the ground and turning into soil nutrients.

The Decayed Wood Advisor (DecAID) by Mellen et al. (2006) was used to compare dead wood availability in the Loon area to a reference condition. The Decayed Wood Advisor (DecAid) is a synthesis of published scientific literature, research data, wildlife databases, forest vegetation databases, and expert judgment and experience. DecAid is not a mathematical model or wildlife/wood-decay simulator, and does not suggest snag retention levels for individual harvest units.

For the Loon project, snag habitat was assessed at the landscape scale using the Current Vegetation Survey (CVS) data collected in the Lookingglass and Grande Ronde River Cabin Watersheds**.** CVS inventories (Brown 2003) are permanent plots on a 1.7-mile grid that sample the vegetative condition on Forest Service land. Plots within the Loon analysis area were then compared to CVS snag data in DecAID that was collected from unharvested areas of the Blue Mountains.

In dry upland forest, the amount of the landscape with 0 snags per acre is relatively close to reference conditions (Figures 3-1 and 3-2). In the > 20 inch subset, the area lacking in 1 to 4 snags per acre is somewhat balanced out by an oversupply of areas with more than 4 snags per acre (Figure 3-2).

For moist upland forest, the disparity between reference and current conditions is greater (Figures 3-3 and 3-4). The amount of area in the Loon watersheds with 0 snags per acre is about double what the reference condition shows. Another pronounced difference is in the > 20 inch subset (Figure 3-4) for snag densities between 0 and 4 snags/acre. Nine percent of the Loon area falls within this condition, while the reference condition shows that 35 percent of the area should have these levels.

Although the data from unharvested areas may not accurately reflect "pre-settlement" or "natural" conditions in eastside forests due to years of fire exclusion (Mellen et al. 2006), it is comparable to other estimates of historic dead wood densities (Harrod et al. 1998, Agee 2002, Ohmann and Waddell 2002).

Some stands have a closed canopy, even age class with little down wood on the forest floor, but for most of the Loon analysis area, down wood densities are higher than would have occurred historically when fires might have burned through more regularly.

Figure 3-1. Distribution of Snags > 10" dbh in Dry Upland Forest

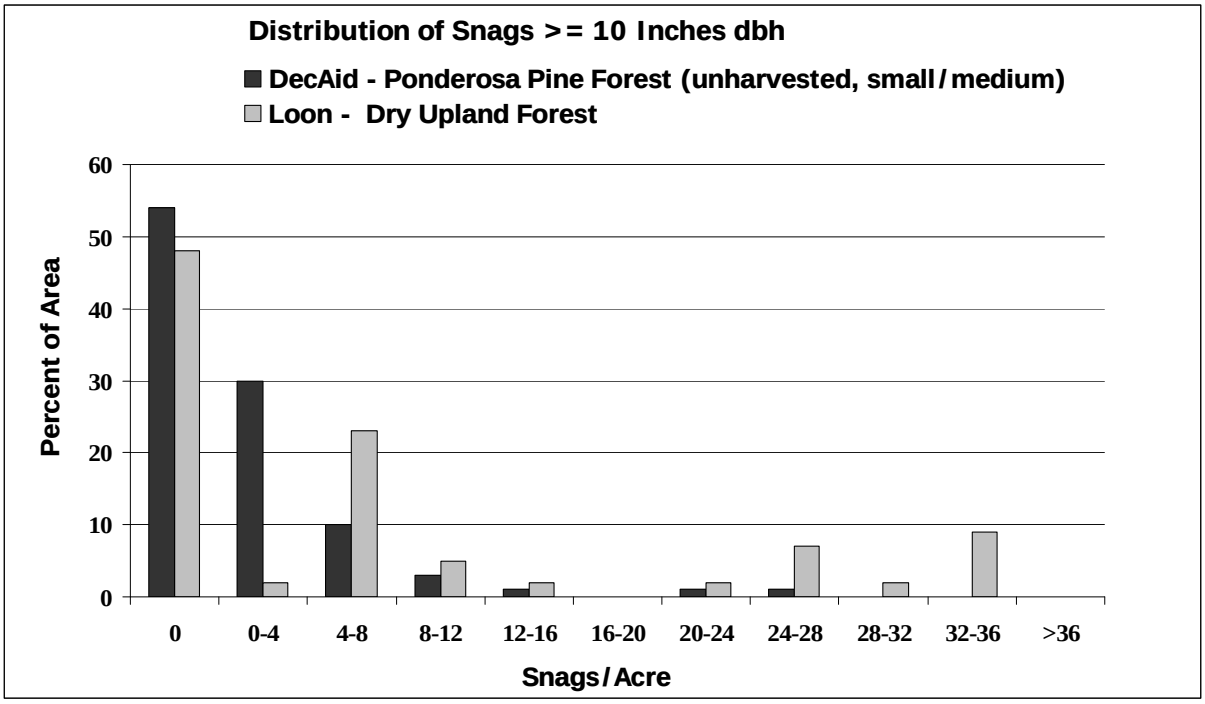


Figure 3-2. Distribution of Snags > 20" dbh in Dry Upland Forest

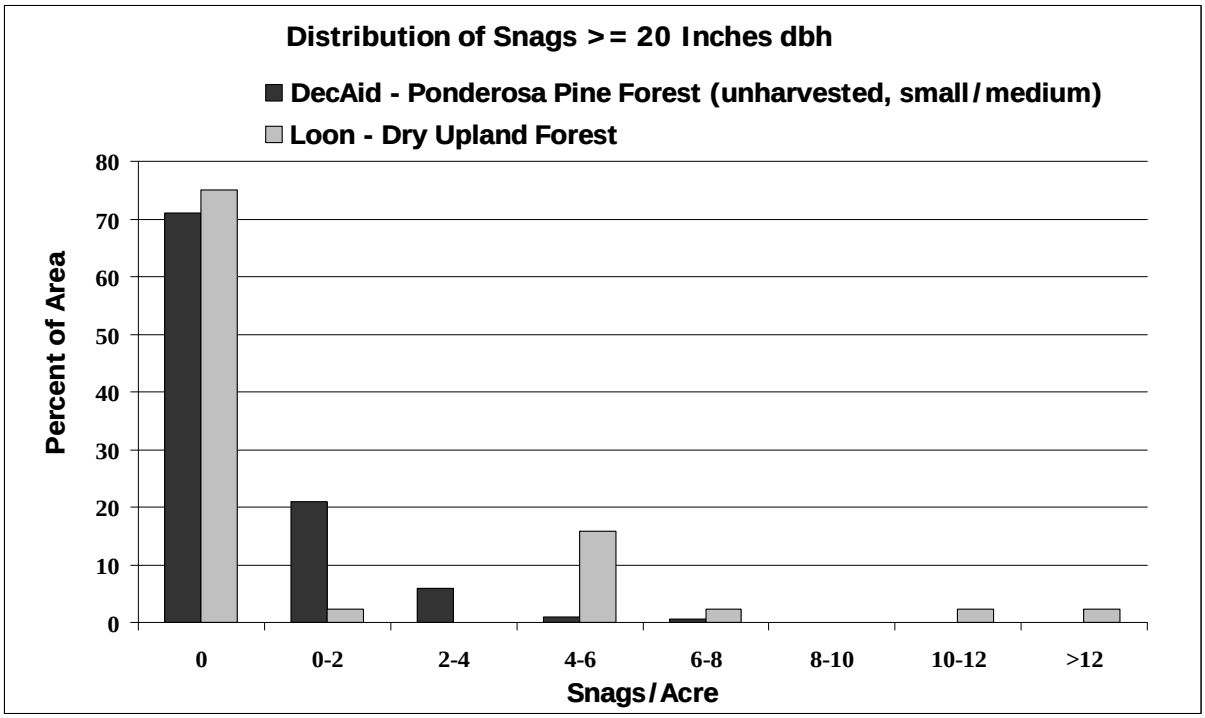


Figure 3-3. Distribution of Snags > 10" dbh in Moist Upland Forest

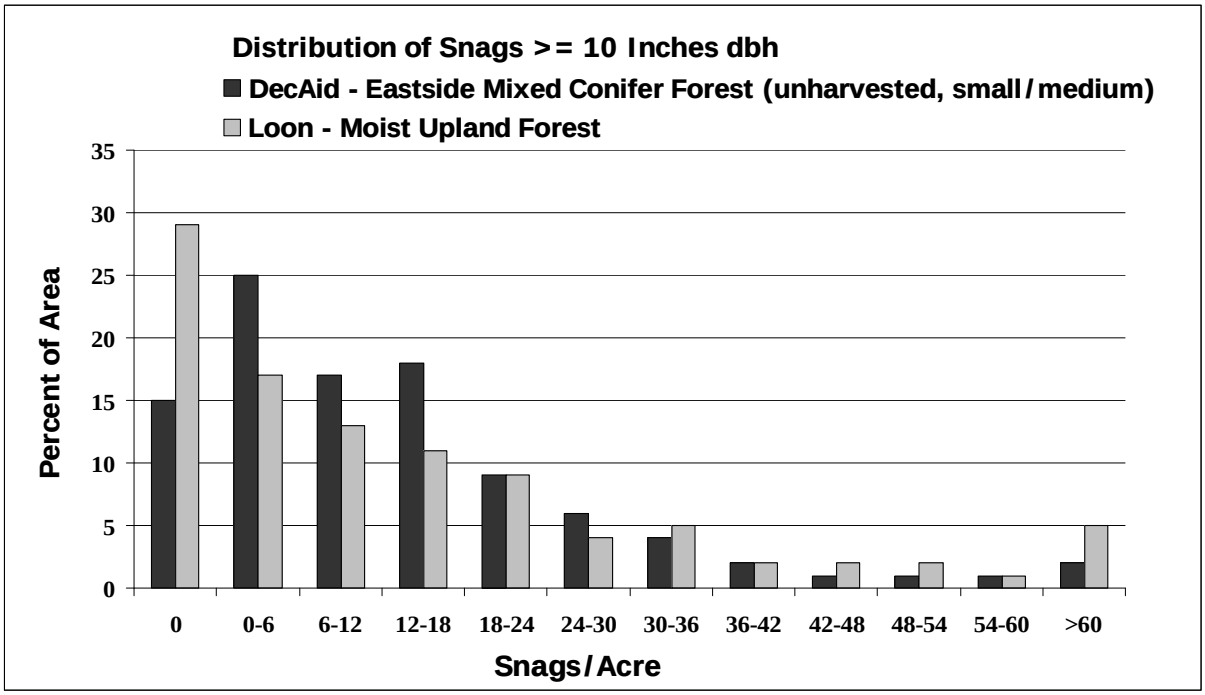
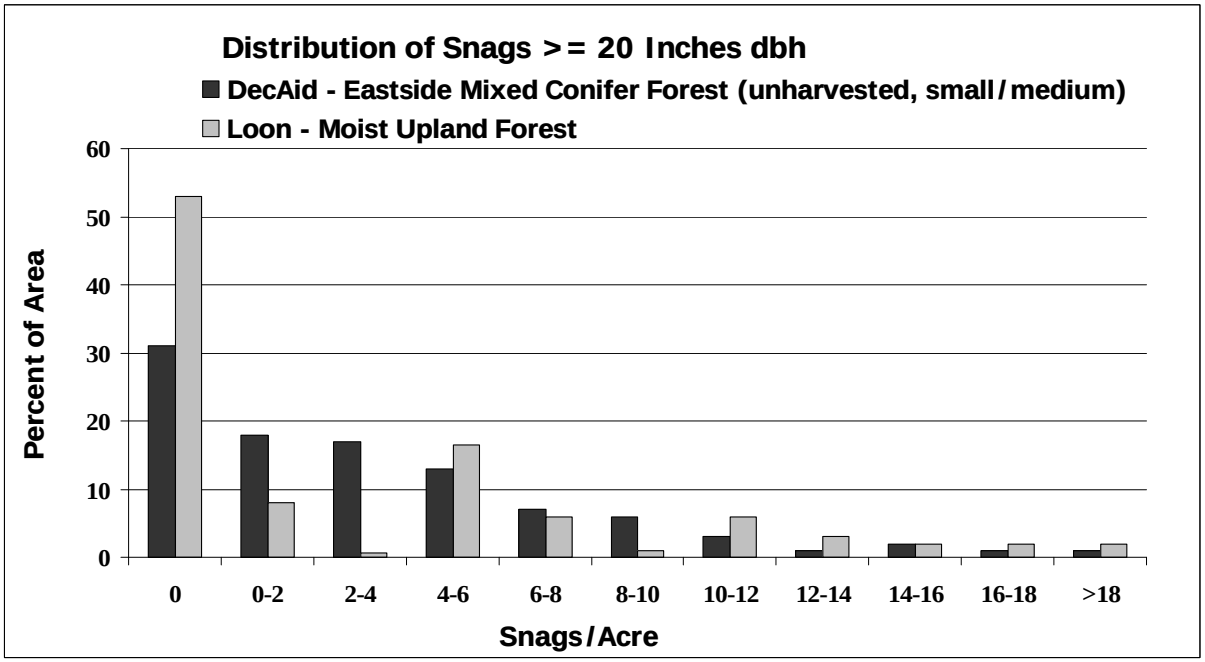


Figure 3-4. Distribution of Snags > 20" dbh in Moist Upland Forest



Northern Three-toed Woodpecker: The northern three-toed woodpecker was selected as an indicator species in the Forest Plan to represent dead and down tree habitat in mature and old growth lodgepole pine stands. It is unlikely that three-toed woodpeckers currently exist in the Loon planning area except as occasional foragers. The three-toed woodpecker will not be affected by the proposed activities because there are no proposed activities in mature or old growth lodgepole pine. Therefore, no further analysis of environmental effects will occur for the three-toed woodpecker.

Pileated woodpecker: Pileated woodpecker was selected as an indicator species in the Forest Plan to represent dead and down tree habitat in mature and old growth mixed conifer stands. The large holes

they create in trees provide nests for many of the larger secondary cavity nesters. Of the woodpeckers, the pileated is the most likely to be affected by timber management practices due to its large size and resultant need for large dead trees for nesting, roosting, and foraging. Approximately 90% of the diet of these birds consists of carpenter ants, which are associated with large standing and downed wood. Preferred habitat consists of large blocks of grand fir and mixed conifer stands in late and old structural stages with large diameter snags and down wood (Bull and Holthausen 1993).

Pileated woodpeckers have been observed in the Loon analysis area, but no formal surveys were done. Primary habitat is concentrated in the upper reaches of the larger drainages, and in Dedicated Old growth and other large stands just south of Jubilee Lake. In moist upland forest, Old Forest Multi-Story stands are practically non-existent, while Old Forest Single Story occurs on about 3,000 acres in the Loon planning area (HRV analysis).
Primary Cavity Excavators

Primary Cavity Excavators: The primary cavity excavator guild was selected as an indicator species in the Forest Plan to represent a vast array of vertebrate species that depend upon dead standing trees and down logs for reproduction and/or foraging. Primary cavity excavators include 15 bird species that create holes for nesting or roosting in live, dead or decaying trees. Secondary cavity users such as owls, bluebirds, and flying squirrels may use these cavities later for denning, roosting, and/or nesting.

Habitat for primary cavity excavators includes coniferous and hardwood stands in a variety of structural stages and the availability of dead trees in various size and decay classes (Thomas 1979). Primary habitat generally contains snags greater than 15" dbh, while smaller sizes provide secondary habitat.

Primary cavity excavators that may be present include Lewis' woodpecker, white-headed woodpecker, northern flicker, hairy woodpecker, downy woodpecker, Williamson's sapsucker, red-naped sapsucker, black-capped, chestnut, and mountain chickadees, and the red-breasted, white-breasted, and pygmy nuthatches.

There is little habitat available within the planning area for Lewis' woodpecker, white-headed woodpecker, and pygmy nuthatch. White-headed woodpeckers are most common in extensive stands of late and old ponderosa pine. There are currently less than 100 acres of this habitat in the Loon planning area. Lewis' woodpecker also prefers more open pine, and is attracted to burned old forest, also lacking in the planning area.

Habitat for other primary cavity excavators is variable with most available in areas of light or no management activities, and less in areas of intensive management. This is the result of several factors including, past fire prevention, timber salvage, and an inadequate number retained or loss of snags and replacements in previously harvested units. Insect and disease activity, drought, and overstory mortality due to high stand densities have created new snags and down wood.

Environmental Consequences of Alternative A - No Action to Pileated woodpecker and other primary cavity excavators

This alternative would provide the greatest amount of snags and large down wood for cavity dependent species. Additional snags and large down wood would be created as overstory mortality increases and dead trees eventually fall creating new foraging and nesting habitat. Population numbers would likely increase with the additional nesting and foraging habitat. Stands would continue to develop old growth habitat characteristics (large trees, large snags, down wood, multi-story canopy) in the long-term.

Any increase in disease and insect occurrence could improve habitat by creating foraging and nesting habitat (dead wood). There is an increased risk of wildfire that could reduce nesting habitat for pileated woodpecker, but other woodpecker species would respond positively. The black-backed woodpecker and Lewis' woodpecker would benefit due to their preference for recently burned stands. Most other woodpeckers would respond to fire by shifting their use to adjacent unburned or lightly burned stands.

Environmental Consequences Common to All Action Alternatives to Pileated woodpecker and other primary cavity excavators

Silvicultural treatments designed to promote the development of LOS habitat with a snag and down wood component are expected to improve habitat for cavity dependent species. Fuels treatments would remove some existing dead and down wood habitat in order to reduce the fuel loading in strategic areas. Hazard tree removal would also reduce standing dead trees.

A minimum of 3-6 down logs per acre (in the dry plant association) or 15-20 down logs per acre (in the moist plant association) would be retained to meet Forest Plan standards as amended.

Only 9% of the snag analysis area has between one and four large (> 20"dbh) snags per acre, whereas under natural conditions we would expect about 35% of the landscape to have this density (Figure 4). In order to ensure that our activities would not reduce snags on the landscape beyond desired conditions, three large snags per acre would be retained in treatment areas. If large snags are not available, snags between 10 and 19 inches can be substituted.

A minimum of 16 green trees per acre would be left for future snag development in moist forest, and 23 per acre in dry forest. The majority of stands would exceed this number.

Primary habitat for pileated woodpecker and white-headed woodpecker would not be affected because no activities are proposed in late and old structure stage stands. Harvest may decrease secondary foraging habitat due to the reduction of dead and down wood habitat. In a few units where salvage is emphasized, all snags greater than or equal to 21 inches dbh would be retained, as well as an adequate number of replacement trees for future snag development. The risk of losing existing interior habitat to a wildland fire would be slightly reduced after fuels treatments are completed. In the long term, this would benefit most cavity excavators. Proposed stand treatments would begin to repair areas affected by fire exclusion and past harvest, ultimately providing more resilient forest that will continue to provide snag habitat into the future.

The estimated snag density in both the $\geq$10-inch diameter group and the $\geq$20-inch diameter group would be reduced by less than one percent in both dry forest and moist forest at the watershed scale. Very little measurable difference can be shown between the alternatives because a small amount of the landscape is proposed for treatment in all cases, and overall snags are plentiful in the watersheds.

Cumulative Effects to Pileated woodpecker and other primary cavity excavators:

Large, well connected blocks of old forest have decreased across the Umatilla Forest due to past timber harvest, firewood and hazard tree cutting, and large wildland fires. Large diameter trees, snags, and down wood have generally decreased. It is likely that pileated woodpecker populations have decreased from historical numbers within the true mixed conifer ecotypes, but at the same time increased in dry forest where fire suppression has led to later successional stages.

Ongoing activities such as hardwood restoration would benefit species such as Williamson's sapsuckers. Timber harvest activities in addition to existing recreational use of the area could behaviorally disturb birds to a small degree, but not for extended periods.

Personal firewood collection and roadside hazard tree removals would contribute to snag reductions, however the overall effects on snag dependent wildlife would be small because removal typically occurs only within 150 feet of open roads.

Landbirds

The Conservation Strategy for Landbirds (Altman 2000) identifies three priority habitat types: Dry Forest, Late Successional Mesic Mixed Conifer, and Riparian Woodland and Shrub. Several "unique" habitats are also important.

The *Dry Forest* habitat type is characterized as coniferous forest composed exclusively of ponderosa pine, or dry stands co-dominated by ponderosa pine and Douglas-fir or grand fir. The desired condition is a large tree, single-layered canopy with an open, park-like understory. Focal species and habitat conditions include: white-headed woodpecker for large patches of old forest with large trees and snags; flammulated owl for old forest with interspersion of grassy openings and dense thickets; chipping sparrow for open understory with regenerating pines, and Lewis' woodpecker for patches of burned old forest.

This type of habitat is very rare in the Loon planning area, comprising only 2 percent of the dry upland forest. The historic range of variability analysis for this area indicates that 15-55 percent of dry forest stands would occur in the Old Forest Single Structure (OFSS) stage. Many of the OFSS stands are now multi-structured because Douglas-fir and grand fir have become established in the understory.

Late Successional Mesic Mixed Conifer habitats are primarily Douglas-fir and grand fir sites. The desired condition is a multi-layered old forest with a diversity of structural elements. Focal species and habitat conditions include: Vaux's swift for large snags; Townsend's warbler for overstory canopy closure, varied thrush for structurally diverse, multi-layers; MacGillivray's warbler for a dense shrub layer in forest openings or understory; and olive-sided flycatcher for edges and openings created by wildfire.

This type of habitat is also very rare in the Loon planning area, comprising less than 1 percent of the moist upland forest. The Historic Range of Variability analysis for this area indicates that 10-30 percent of these stands would occur in the Old Forest Multi Structure (OFMS) stage. Few areas would be considered structurally diverse and understory shrubs are lacking. Most stands have a closed canopy single story layer with little growing underneath. Dense shrub layers within these types are less common but occur in patches. No edges and openings created by fire are found in this planning area.

The desired condition of *Riparian Woodland and Shrub* habitat for birds is a structurally diverse vegetative community of native species that occur in natural diversity relative to hydrological influences. Riparian vegetation is particularly important to Neotropical migratory songbirds (Sallabanks et al. 2001). Focal species and habitat conditions include: Lewis' woodpecker for large snags; red-eyed vireo for canopy foliage and structure; veery for understory foliage and structure; and willow flycatcher for willow/alder shrub patches.

Riparian habitat as described above is plentiful in this area, with many complex streams and a diversity of vegetation. The area is not grazed by cattle. Major drainages include Lookingglass, Mottet, Cabin, Gordon, and Little Phillips Creeks. Wet areas such as seeps, bogs, and springs also provide small patches of riparian habitat.

Focal species and habitat conditions for *Unique* habitats include: vesper sparrow for steppe shrubland, gray-crowned rosy finch for alpine, hermit thrush for subalpine forest, upland sandpiper for montane meadows, and red-naped sapsucker for aspen.

No steppe shrublands or alpine habitats occur in the planning area. A small amount of subalpine habitat occurs in the highest elevations. Grassy ridges are scattered throughout the area, but no large montane meadows are present. Aspen and cottonwood is a very small component of the landscape but is present in the planning area.

Environmental Consequences Unique to Alternative A - No Action to Landbirds

The condition of habitats for land birds would not change in the short term. Habitat for birds that tend to occur in open, single-stratum stands and understory shrubs could decrease in the future due to continued fire exclusion, increased stand densities, and small existing patch sizes. If a low intensity fire were to occur, species associated with edge and burned habitats would thrive, and more single story ponderosa pine habitat might be provided. If a larger stand-replacing event took place, there would be an influx of woodpeckers and other birds that feed on tree insects.

Environmental Consequences Common to All Action Alternatives to Landbirds

Timber removal and fuels treatments such as mastication, underburning, jackpot burning, or pile burning would remove some shrubs, grasses, and seedlings from the understory, which would temporarily reduce cover and decrease foraging habitat for some birds. If activities occur during springtime, a small number of nesting birds would be displaced. In the long term, habitat for land birds that tend to use more open stands with understory shrubs would slightly increase with thinning and fuels treatments. Riparian and montane meadow habitat would not be affected by proposed activities. Aspen and cottonwood habitat would not be affected by proposed activities, but ongoing fencing and other enhancements could cumulatively improve habitat.

Risk of large scale wild land fire would be slightly reduced, conserving existing forest canopy that many birds use, but not necessarily the habitat types of concern. A small amount of thinning in ponderosa pine could enhance the development of open, mature stands.

At least three large snags per acre would be left within harvest units. Surveys in unharvested areas indicate that between one and four large snags per acre should occur on about one third of the landscape. Since this condition occurs on only 9% of the area, retention of large snags is being emphasized, ultimately benefiting focal species such as Vaux's swift and white-headed woodpecker.

Environmental Consequences Unique to Alternatives B to Landbirds

Harvest and fuels treatments would temporarily reduce understory habitat for some birds on 1923 acres. Stand improvements would occur on 250 acres of dry forest, which could enhance the development of open, mature ponderosa pine stands in the long term.

Environmental Consequences Unique to Alternative C to Landbirds

Harvest and fuels treatments, would temporarily reduce understory habitat for some birds on 2162 acres. Stand improvements would occur on 250 acres of dry forest, which could enhance the development of open, mature ponderosa pine stands in the long term.

Environmental Consequences Unique to Alternative D to Landbirds

The primary objective of Alternative D is fuels reduction and impacts the least amount of habitat. Harvest and fuels treatments would temporarily reduce understory habitat for some birds on 1196 acres. Stand improvements would occur on 227 acres of dry forest, which could enhance the development of open, mature ponderosa pine stands in the long term.

Northern goshawk

The Umatilla forest plan, as amended by Regional Forester's Eastside Forest Plan Amendment 2, (USDA 1995) provides protections for goshawk nesting territories. Goshawk surveys were conducted in the planning area in June 2007. Due to limited staff and time, surveys were focused on potential harvest areas rather than the best habitat in the analysis area. No territories were found, however several goshawks were incidentally observed.

Environmental Consequences Unique to Alternative A - No Action to Northern goshawk

No changes in existing habitat would occur. If nesting territories exist in the planning area, levels of disturbance to nesting birds would remain the same. If a large wildland fire were to occur, nesting habitat could be removed, fragmented, or unaffected depending on fire behavior.

Environmental Consequences Common to all Action Alternatives to Northern goshawk

Harvest and fuels reduction would not likely affect primary habitat for northern goshawk, since no old forest would be treated. In proposed units, all trees $\geq$ 21 inches dbh would be retained in the stand, which would preserve future nesting trees for goshawk.

Connectivity between old forest stands would be maintained at current levels. Over time, stands in early successional stages would develop habitat characteristics that would result in additional connective corridors.

Cumulative Effects to Northern goshawk

Past timber harvest has reduced habitat for northern goshawk in this area. Roads and increased recreation have likely caused changes in habitat use. Additional timber harvest could cumulatively cause negative impacts to goshawk, however none are known to nest in the area. If a nest site is located during unit layout or harvest activities, immediate protection measures would be employed.

Threatened, Endangered, and Sensitive Wildlife Species

Federally listed species includes those identified as Endangered, Threatened, Proposed, or Candidate species by the U.S. Fish and Wildlife Service (USDI 1999). "Sensitive" species are those identified on the Regional Forester's (R6) Sensitive Animal List (USDA 2000) that meets National Forest Management Act obligations and requirements. Sensitive species addressed on the Umatilla National

Forest include those that have been documented or suspected (likely to occur, based on available habitat to support breeding pairs/groups) and occurring within or adjacent to Forest boundary.

Based on District records, surveys, and monitoring, as well as published literature about distribution and habitat utilization, species that might occur in the analysis area include the gray wolf, Canada lynx, California wolverine, inland tailed frog, Columbia spotted frog, northern bald eagle, Lewis' woodpecker, and white-headed woodpecker.

The peregrine falcon, upland sandpiper, Townsend's big-eared bat, northern leopard frog, and painted turtle are not expected to occur in the planning area. These four species and their habitat would not be affected by the proposed activities; therefore, no further discussion is necessary.

Bald Eagle (Sensitive): Bald eagles are occasionally seen at Langdon and Jubilee Lakes, but no nests are suspected in the area. Lookingglass Creek may provide year round foraging opportunities for eagles. The nearest known nest is about 8 miles east of the Loon planning area.

*White-headed and Lewis' woodpecker (Sensitive)***:** These two species have already been discussed under the primary cavity excavator section as well as the land bird section. Both species are associated with open woodlands with large diameter trees and snags. Very few observations of either species have been reported on the district, and habitat is limited, but there is a slight chance that they could be in the area.

Open woodland habitat with large diameter trees is very rare in the Loon planning area, comprising only 2 percent of the dry upland forest.

California Wolverine (Sensitive): Wolverines typically inhabit high elevation conifer forest where sufficient food is available and human activity is low. Denning habitat is usually open rocky talus slopes where snow depths remain over 3 feet into spring. They tend to forage over large areas and travel long distances. The majority of the planning area is suitable for wolverine foraging, but no potential denning areas are known. A wolverine was recently reported near the Loon area, but was not confirmed. There are no indications that wolverine do more than pass through on a rare occasion.

*Inland Tailed Frog (Sensitive)***:** Tailed frogs have been observed in cold water streams on the district. They may be present in streams within the planning area. Generally tailed frog habitat would not impacted by forest management activities, since it is within protected Riparian Habitat Conservation Areas.

Bighorn Sheep (Sensitive): Rocky Mountain bighorn sheep were native to much of the mountain and canyon country in northeast Oregon and southeast Washington, but were gone from the region by 1945. Habitat capability for bighorn sheep is relatively low in the Loon planning area. Preferred habitat for bighorn sheep consists of rugged, open to semi-open areas of coniferous grassland or grass/shrub plant communities that affords high visual contact with their surroundings. Expanses of rim rock, cliffs, and rocky outcroppings are especially important for lambing and escape from predators.

Several reintroductions of Rocky Mountain bighorn sheep occurred in the mid-1980s in the Wenaha - Tucannon Wilderness. The herd experienced a major die-off during the winter and spring of 1995-1996 attributed to *Pasteurella* pneumonia, which reduced the population by about half. Pneumonia, scabies, and lungworms continue to threaten the health and survivability of the herd. Since domestic sheep are permitted in the Loon area, bighorn sheep essentially cannot use the area.

Columbia Spotted Frog (Great Basin population) (Sensitive): Columbia spotted frogs may be present in the planning area, although they have not been observed. Suitable habitat for the spotted frogs can be found in the planning area in streams, ponds, and marshy areas with abundant aquatic vegetation. Generally these wet areas are not impacted by forest management activities, because they are within Riparian Habitat Conservation Areas.

It is unclear whether the Great Basin population of spotted frog occurs on the Umatilla Forest. There appears to be a break between the Great Basin and Northern (or Rocky Mountain) spotted frog populations somewhere in eastern Oregon, but the exact line is unclear (Tait 2007). The Northern population is not considered imperiled, and is not listed as sensitive by the Regional Forester.

Gray wolf (Endangered): The wolf is a habitat generalist inhabiting a variety of plant communities, typically containing a mix of forested and open areas with a variety of topographic features. Both dens and rendezvous sites are often characterized as having nearby forested cover and being remote from human disturbance. Wolves Thiel 1985, Mech et al. 1988, Mech 1989) but apparently can occupy semi-wild lands if ungulate prey are abundant and if not killed by humans (see Mladenoff et al. 1997).generally avoid heavily roaded areas (Thiel 1985).

Single wolf sightings are occasionally reported, and a wolf was killed recently on the district. No packs are believed to have formed, and no denning or rendezvous sites are known. Wolves dispersing from the Idaho population will likely continue to find their way into the Blue Mountains. The close proximity of wilderness makes it plausible that a wolf would use the Loon area at some point in time.

Canada lynx (Threatened): The Loon planning area currently provides about 3000 acres of lynx foraging and/or denning habitat. Primary vegetation that contributes to lynx habitat includes subalpine fir habitat types where lodgepole pine is a major seral species, generally between 4,100-6,600 feet in elevation. Secondary vegetation, when interspersed or adjacent with subalpine forest may also contribute to lynx habitat.

The Loon planning area falls within the Langdon Lynx Analysis Unit (LAU). Watershed lines, roads, and ownership boundaries were generally used as LAU boundaries, where the size of the LAU represents the home range typical of lynx in southern portions of their distribution. The Langdon LAU currently provides 15,000 acres of habitat that could be used by lynx and their prey. Insects, disease, and timber harvest have reduced the value of the Langdon LAU as lynx habitat. If habitat in the Langdon LAU were in better condition, the Loon area would be a logical connective corridor between lynx habitat in the Tollgate area and the Wenaha – Tucannon wilderness.

Many unconfirmed visual observations of lynx have been reported on the Walla Walla Ranger District in the past 20 years. Seven of these were observed along Oregon State Highway 204, which is the southern boundary of the planning area. A Forest Service employee has also reported seeing a lynx near Jubilee Lake. Due to similarities with the more common bobcat (*Lynx rufus*), reported sightings are generally suspect. Highway 204 is a well-traveled highway through the mountains. The repeated sightings over the years, combined with the experience of some of the people who reported the sightings, gives the reports some validity, however no physical evidence has been obtained (i.e. no tracks were measured or photographed, no hair was collected, and no photographs were taken of the animals).

Extensive field surveys for lynx were conducted on the south end of the Umatilla National Forest from 1999 to 2001 using the National Lynx Detection Protocol (McKelvey et al. 1999). A similar survey was conducted on the adjacent Wallowa-Whitman National Forest. Additional hair snag surveys were completed in association with USFWS, using similar, but less extensive methods. On the Umatilla NF, nine areas were sampled by USFWS. Two of these survey areas were near the and correlations with cyclic highs with populations in Canada, the U.S. Fish and Wildlife Service concluded that lynx could occur in Oregon as dispersers that have never maintained resident populations (USDI 2003). The Umatilla Forest is currently considered "unoccupied" by Canada lynx (USDA 2006).

Environmental Consequences Unique to No Action to **Threatened, Endangered, and Sensitive Wildlife Species**

The condition of habitats for listed and sensitive wildlife species would not change in the short term. In the long term habitat would not change other than through natural processes. Growth in vegetation throughout would eventually result in an increase of foraging and security habitat for species such as wolverine and lynx. Even if wildland fire were to occur, the flush of new vegetation on high elevation sites would soon provide good foraging habitat for lynx. Since none of the wildlife TES species are known to inhabit the area, there would be no effect to individuals if proposed actions were not implemented. Habitat for Lewis' and white-headed woodpecker could decrease in the future due to continued fire exclusion, increased stand densities, and small existing patch sizes.

Environmental Consequences Common to All Action Alternatives to **Threatened, Endangered, and Sensitive Wildlife Species**

Implementation of proposed activities should not directly affect any of the TES species potentially occurring in the planning area. None of these species are actually known to regularly inhabit the Loon planning area. If any of these species were to pass through or take up residence in the area, the increased traffic, equipment noise, and human presence could lead to temporary avoidance of the area. Habitats would not be modified to the point that the planning area would be rendered uninhabitable by these species.

There would be no impacts to bald eagle since no use is documented within the planning area. Eagles may occasionally be present near Lookingglass Creek and Jubilee Lake. No activities would impact these areas.

There would be no impacts to wolverine since no denning habitat is known within the planning area.

There would be no impact to tailed frogs and spotted frogs because their habitat is protected by Riparian Habitat conservation measures.

Since wolves are not currently known to occur in the area, and no denning or rendezvous sites are known, there would be no effect to gray wolf. The open road density in the analysis area would remain low, and prey species would be abundant.

There would be no impacts to Lewis' and white-headed woodpeckers because no activities are proposed in late or old structural stage forest. A small amount of thinning in ponderosa pine could enhance the development of future mature, open stands they tend to favor. All trees greater than or equal to 21 inches dbh, and at least three large snags per acre would be retained in harvest units.

No direct effects to Canada lynx are expected to occur because the project does not propose any activities identified as mortality risk factors such as trapping or highway expansions. Indirectly, mechanical harvest, low intensity burning (jackpot), and mastication (slash-busting) would remove vegetation and change vegetation structure and patch distribution such that suitable lynx habitat, in most cases, would become unsuitable for lynx in the short term. At the same time, single story, stem exclusion stands that are opened up by thinning and improvement harvest would quickly develop an understory more suitable for lynx prey species.

Environmental Consequences Unique to Alternatives B and C to Threatened, Endangered, and Sensitive Wildlife Species

Under Alternative B, lynx habitat would be temporarily reduced by 517 acres, leaving 2,483 acres of suitable lynx habitat available in the planning area. Suitable lynx habitat would be reduced by 200 acres in Alternative C, leaving 2,800 acres of suitable lynx habitat available in the planning area.

There would be no effect to Canada lynx, because the Blue Mountains are considered 'unoccupied' by resident lynx (USDA 2006). A small reduction of suitable habitat on the fringe of lynx range is not expected to have any impact on the lynx population. planning area (Jubilee Lake and Fry Meadow). None of the surveys resulted in the detection of lynx.

Based on the lack of reproduction records, limited verified records of lynx, low frequency of occurrences, and correlations with cyclic highs with populations in Canada, the U.S. Fish and Wildlife Service concluded that lynx could occur in Oregon as dispersers that have never maintained resident populations (USDI 2003). The Umatilla Forest is currently considered "unoccupied" by Canada lynx (USDA 2006).

Environmental Consequences Unique to Alternative A - No Action **Threatened, Endangered, and Sensitive Wildlife Species**

The condition of habitats for listed and sensitive wildlife species would not change in the short term. In the long term habitat would not change other than through natural processes. Growth in vegetation throughout would eventually result in an increase of foraging and security habitat for species such as wolverine and lynx. Even if wildland fire were to occur, the flush of new vegetation on high elevation sites would soon provide good foraging habitat for lynx. Since none of the wildlife TES species are known to inhabit the area, there would be no effect to individuals if proposed actions were not implemented.

Environmental Consequences Common to All Action Alternatives to **Threatened, Endangered, and Sensitive Wildlife Species**

Implementation of proposed activities should not directly affect any of the TES species potentially occurring in the planning area. None of these species are actually known to regularly inhabit the Loon planning area. If any of these species were to pass through or take up residence in the area, the increased traffic, equipment noise, and human presence could lead to temporary avoidance of the area. Habitats would not be modified to the point that the planning area would be rendered uninhabitable by these species.

There would be no impacts to bald eagle since no use is documented within the planning area. Eagles may occasionally be present near Lookingglass Creek and Jubilee Lake. No activities would impact these areas.

There would be no impacts to wolverine since no denning habitat is known within the planning area.

There would be no impacts to bighorn sheep because the area is not suitable for their use.

There would be no impact to spotted frogs because their habitat is protected by Riparian Habitat conservation measures.

Since wolves are not currently known to occur in the area, and no denning or rendezvous sites are known, there would be no effect to gray wolf. The open road density in the analysis area would remain low, and prey species would be abundant.

No direct effects to Canada lynx are expected to occur because the project does not propose any activities identified as mortality risk factors such as trapping or highway expansions. Indirectly, mechanical harvest, low intensity burning (jackpot), and mastication (slash-busting) would remove vegetation and change vegetation structure and patch distribution such that suitable lynx habitat, in most cases, would become unsuitable for lynx in the short term. At the same time, single story, stem exclusion stands that are opened up by thinning and improvement harvest would quickly develop an understory more suitable for lynx prey species.

***Environmental Consequences Unique to Alternatives B and C to* Threatened, Endangered, and Sensitive Wildlife Species**

Under Alternative B, lynx habitat would be temporarily reduced by 517 acres, leaving 2,483 acres of suitable lynx habitat available in the planning area. Suitable lynx habitat would be reduced by 200 acres in Alternative C, leaving 2,800 acres of suitable lynx habitat available in the planning area.

There would be no effect to Canada lynx, because the Blue Mountains are considered 'unoccupied' by resident lynx (USDA 2006). A small reduction of suitable habitat on the fringe of lynx range is not expected to have any impact on the lynx population.

Ecosystems and Diversity

The following is a summary of the analysis found in the Silvicultural specialist report for the Loon Fuels Reduction Project and supplemented with additional information in the EA. The report can be found in the Project Analysis File.

The primary modifying events that create diverse plant communities are: wildfire, grazing and browsing, insect and disease epidemics, windthrow, flooding, and erosion. Of these, wildfires historically played the greatest role in maintaining diverse landscape vegetation. Fires of various intensities and sizes burned across the landscape, shaping the vegetation patterns. The shorter the fire return interval, the less dramatic would be the result of the fire on total plant composition, maintaining the stand with a dominance of early seral tree species, such as ponderosa pine and western larch. Stands with infrequent fire return intervals burned more completely and often were replaced by vegetation different in composition, structure, and age. These fires tended to be extensive, several tens of thousands acres in size such as the one that established the current forest that occurred in the late 1800s. Fire, landscape variation, topography, climate patterns, and other disturbance processes have all combined to provide a

rich mosaic of plant communities. With the current lack of fire disturbance, this diversity of plant communities no longer exists. Forests maintained by frequent fires and mixed fire return intervals have changed, becoming over stocked with higher levels of grand fir and Douglas-fir and a more complex fuel structure. These changes in vegetation structure has been documented since the early 1990's beginning with the *Blue Mountains Forest Health Report, "New Perspectives in Forest Health"* in 1991 to the Interior Columbia Basin Project in 2000.

There are four fire regime groups that shape the planning area's landscape. Dry forest stands characterized by ponderosa pine were maintained by the frequent fire regime, a low severity fire with a 0 to 35 year return interval. Both ponderosa pine and western larch were favored by the mixed fire regime, wildfires of mixed severity with a 35 to 100 year return interval. Grand fir, Douglas fir, and subalpine fir were favored by the longer return interval of the infrequent fire regime, a stand replacement severity wildfire with a return interval greater than 200 years. The dry grasslands on the south facing slopes had a sort return interval, stand replacement regime that helped to keep trees from encroaching on the grasslands.

The stands in the analysis area have departed from historic vegetation conditions and have become overstocked with shade-tolerant species with exclusion of fire over the last 70-80 years. In the Dry Forest ponderosa pine type, Douglas-fir has become overstocked in the understory, and with grand fir in the Moist Forest type. The competitive pressure on the older, less vigorous overstory component has been occurring for a number of years with the changes in canopy structure from mostly single canopy stratum to multi-canopy structures. This overstocked condition has increased the risk and vulnerability of stands to damage by defoliating insects, bark beetles, as well as dwarf mistletoes, and increased fuel ladder structures that could lead to stand-replacement fire events. In these mostly drier grand fir and Douglas-fir/ponderosa pine types, a fire occurrence of 10-20 year-intervals is the more common historic condition. The encroachment of Grand fir and Douglas fir also helps proliferate root diseases.

The recent drought cycle in the mid-1980's to present and the overstocked condition of mature stands has reduced individual tree vigor and predisposed susceptible tree species to increased incidence of insect attack. The primary insects that have cyclic population levels in this area are Douglas-fir tussock moth, Douglas-fir and pine bark beetles and western spruce budworm. The forests in this area rate as a high risk for Western spruce budworm infestation. The area nearby has experienced significant spruce blowdown in the last two winters, this puts the area at risk for spruce beetle attacks. The risk of outbreaks of Douglas-fir tussock moth and Douglas-fir beetle is moderate to high. Fir engraver beetles, as well as dwarf mistletoe in Douglas-fir and larch, and root rots, are also active agents of accelerated mortality in stands in the analysis area. Recent insect outbreaks and treatments in this area include:

- Western spruce budworm – 1984; sprayed with Bt in 1988 and 1992.
- Douglas fir tussock moth – 1970 and 1998/9; sprayed with DDT in 1974 (and in areas just outside the planning area in 2000)
- Douglas fir beetle – 1988 to 1990
- Spruce beetle – early 1990's following spruce blowdown.

Past forest management activities have contributed to the landscape diversity. Salvage of dead or dying trees during the mid 1970's caused by tussock moth, regeneration harvests to distribute forage and cover in a way to optimize big game management, and the focus on even-aged management by the Forest Plan created patches of early successional stages used as transitional forage for sheep grazing. Plantations of various ages make up approximately 26 percent of the planning area, most of them are moving into the young forest or stem exclusion stage. The regeneration units also provide early successional stages, a

component of horizontal diversity. Early successional stages are relatively abundant making up approximately 10 percent of forest vegetation in the planning area.

The Historic Range of Variability (HRV) analysis summarized structural stages for the 20,180 acre Planning Area. The Planning Area includes the following Biophysical Environments: Cold Forest – 1,113 acres; Moist Forest – 14,506 acres; Dry Forest – 4,508 acres and 61 acres in administrative site. There are not enough acres in the Cold Forest to provide meaningful analysis and no activities are proposed in it; Cold Forest is not being included in the HRV analysis. Table 3-18 provides a summary of the HRV analysis.

The HRV analysis indicates that both Moist Forest and Dry Forest are below historic range of variability for one of the old forest structural stages. Moist Forest is below historic range for Old Forest Multistructure and Dry Forest for Old Forest Single Structure. All green trees 21" DBH and greater will be retained.

Table 3- 18 HRV for the Phillips Gordon Watersheds

PNV		SI	SEOC	SECC	UR	YFMS	OFMS	OFSS
Moist Upland 14,506 acs	*Historic %*	1 - 10	0 - 5	5 - 25	5 - 25	40 -60	10 - 30	0 - 5
	Current %	9	47	7	3	5	0	21
Dry Upland 4,508 acs	*Historic %*	5 - 15	5 - 20	1 - 10	1 - 10	5 - 25	5 - 20	15 - 55
	Current %	17	25	20	1	6	5	2

SI = stand initiation, SEOC = stem exclusion/open canopy, SECC = stem exclusion/closed canopy, UR = understory reinitiation, YFMS = young forest/multi-strata, OFMS = old forest/multi-strata, OFSS = old forest/single strata

Approximately 42 percent of the Planning Area is currently in Stem Exclusion Open Canopy, the largest structural stage represented on the landscape. Within 5-10 years many of the Stem Exclusion Open Canopy stands will move into the Understory Reinitiation stage and ultimately to the Young Forest Multistructure, which currently is not well represented.

Vertical and horizontal diversity are landscape components discussed in the Forest Plan Standards and Guidelines for Ecosystems and Diversity. Vertical diversity is measured by the degree of complexity in the above ground structure as tiers of vegetation. Vertical diversity is maintained by small-scale disturbance events such as insect and disease pockets, fires that occur at early successional stages when stands are "fire proof", and windthrow. The landscape will have thickets of young trees because every acre does not burn when a fire returns. Vertical diversity in the frequent fire regime is seen in the development of cohort age grouping under an open canopy while in the infrequent fire regime it is the scattering of age classes and suppressed trees in the understory that create size and height diversity.

There is a high degree of vertical structure in the forested stands, outside of plantations. Approximately 30 percent of the Planning Area are plantations in various degrees of development. About 53 percent of the plantations have an overstory component derived from shelterwood harvests. The Forest Plan (page 4-74) states that structural diversity is best maintained with uneven-aged prescriptions or small even-aged harvest units. The Planning Area has had approximately 11,550 acres of timber harvest of which 5,308 acres has been harvested using even-aged prescriptions and 6,242 acres using uneven-aged prescriptions.

Horizontal diversity is a measure of the successional stages found across the landscape or the amount of edge. Large-scale disturbance events maintain horizontal diversity. Stand replacement wildfires renew stands to earlier stages over large areas; frequent, low intensity wildfires maintain open stand conditions. Windthrow events, root diseases, localized and catastrophic insect outbreaks provide disturbance events that form multi-aged stands or patches of early successional stages. For forest planning purposes early successional stages are developed through plantations. Even-aged management prescriptions emulate the renewal of a stand. Currently there are approximately 2,070 acres of early successional forest in the Planning Area.

Environmental Effects to Ecosystems and Diversity

Environmental Effects of Alternative A – No Action to Ecosystems and Diversity: This alternative would defer action at this time. Stand development would continue favoring shade tolerant species. The stands will move toward later successional stages. The estimated structural stages in 10 years would be similar to the existing condition except the stand initiation (plantations) would move into stem exclusion stage.

This alternative does not increase or enhance species diversity nor would it help restore a more resilient forest; the landscape would continue to transition or retain stand character susceptible to damage from fire, insect attacks and disease. The untreated stands would continue progression towards old forest structure and as insects and disease cause mortality, the created openings would regenerate with fir and spruce. Within the next ten years, mortality of young and mature trees in pockets from 1/10 to 1 acre in size would occur throughout the planning area caused by root rots, dwarf mistletoe, and insects. The understory seedlings, saplings, and pole-size trees would continue to be suppressed by the overstory trees except where opening have been created by the pockets of mortality. The expected mortality, combined with existing standing dead and ladder fuels, would fall to the ground increasing fuel loads and create conditions for extreme fire behavior resulting in stand replacement events in more areas. There would be no change to the stand structure percentages across the landscape.

Environmental Effects of Alternative B – Proposed Action to Ecosystems and Diversity
This alternative would reduce stocking levels and biomass, by harvest, noncommercial thinning, and fuel treatments, on approximately 2870 acres of land. Reducing the competition for water, light and nutrients between trees increases their vigor and health, allowing them to more easily ward off insect attacks. By selecting for certain species, it is also possible to leave trees that are less susceptible to root rots and dwarf mistletoe and thereby try to control the spread of those diseases. Reducing the stocking levels and surface fuels also decreases the available standing and down fuels, making the stand more resilient to wildland fire.

There would be a very small change in the percentage of acres by stand structure as a result of harvest and fuel treatments. See Table 3-19 There would be no changes to structural stages in Dry Forest.

Table 3-19: Structural Stages in Moist Forest from Alternative B

	SI	SEOC	SECC	UR	YFMS	OFMS	OFSS
Acres changed	+ 75	- 11	0	- 312	0	0	+ 248
Percent of Planning Area	9	47	7	1	5	0	23

All proposed harvest prescriptions are uneven aged management. For the most part, un-evenaged management practices and the 75 acres of small openings proposed in this alternative maintains vertical diversity. All harvest prescriptions have unevenaged objectives. Even though there is a focus to remove understory vegetation to reduce potential ladder fuels and surface fuels, a portion of small diameter trees would be retained where individual tree torching would not cause fire to move into the crowns. The thinned overstory or less than 5 acre created opening allows understory development. All harvest prescriptions would leave an overstory of mixed tree age-classes and sizes. The stand would have a mixed age appearance with a gap in the low understory to reduce the risk of fire moving from the ground into the overstory. This action would remove a portion of the vertical diversity from the landscape, approximately 2,075 acres within harvest units or about 10 percent of the planning area. This structure would be found in other places in the planning area and would be replaced in the harvest units within 20 years. The loss would not affect the function of the forest landscape in providing diverse habitat.

Environmental Effects of Alternative C to Ecosystems and Diversity

This alternative would reduce stocking levels and biomass, by timber harvest, fuel treatments, and noncommercial thinning on approximately 3,010 acres of land. Reducing the competition for water, light and nutrients between trees increases their vigor and health, allowing them to more easily ward off insect attacks. By selecting for certain species, it is also possible to leave trees that are less susceptible to root rots and dwarf mistletoe and thereby try to control the spread of those diseases. Reducing the stocking levels also decreases the available standing and down fuels, making the stand more resilient to wildfire events. This alternative will also treat the most acres for fuel reduction, making the stand more resilient to wildland fire by lowering potential wildfire intensity and severity.

There would be a very small change in the percentage of acres by stand structure as a result of harvest and fuel treatments. See Table 3-20 There would be no changes to structural stages in Dry Forest.

Table 3-20: Structural Stages in Moist Forest from Alternative C

	SI	SEOC	SECC	UR	YFMS	OFMS	OFSS
Acres changed	+25	+39	0	- 312	0	0	+248
Percent of Planning Area	9	47	7	1	5	0	23

All proposed harvest prescriptions are uneven aged management. For the most part, un-evenaged management practices and the 25 acres of small openings proposed in this alternative maintains vertical

diversity. Even though there is a focus to remove understory vegetation to reduce potential ladder fuels and surface fuels, a portion of small diameter trees would be retained where individual tree torching would not reach the crowns. The thinned overstory or less than 5 acre created opening allows understory development. All harvest prescriptions would leave an overstory of mixed tree age-classes and sizes. The stand would have a mixed age appearance with a gap in the low understory to reduce the risk of fire moving from the ground into the overstory. This action would remove a portion of the vertical diversity from the landscape within the harvest units, approximately 2,166 acres or about 11 percent of the planning area. This structure would be found in other places in the planning area and would be replaced in the harvest units within 20 years. The loss would not affect the function of the forest landscape in providing diverse habitat.

Environmental Effects of Alternative D to Ecosystems and Diversity

This alternative would reduce stocking levels and biomass, by timber harvest, fuel treatments, and noncommercial thinning approximately 1,990 acres of land. Reducing the competition for water, light and nutrients between trees increases their vigor and health, allowing them to more easily ward off insect attacks. By selecting for certain species, it is also possible to leave trees that are less susceptible to root rots and dwarf mistletoe and thereby try to control the spread of those diseases. Reducing the stocking levels also decreases the available standing and down fuels, making the stand more resilient to wildfire events. This alternative would also treat the most acres for fuel reduction, making the stand more resilient to wildland fire.

There would be a very small change in the percentage of acres by stand structure as a result of harvest and fuel treatments. See Table 3-21 There would be no changes to structural stages in Dry Forest. There would be an increase of approximately 248 acres of OFSS and 31 acres of SEOC with a reduction of 279 acres of UR within Moist Forest. Over the next ten years there would be further changes as SEOC and SECC become UR. There would be no changes to structural stages in Dry Forest.

Table 3-21: Structural Stages in Moist Forest from Alternative D

	SI	**SEOC**	**SECC**	**UR**	**YFMS**	**OFMS**	**OFSS**
Acres Changed	0	+ 31	0	- 279	0	0	+ 248
Percent of Planning Area	9	47	7	1	5	0	23

All proposed harvest prescriptions are uneven aged management. For the most part, the un-evenaged management practices proposed in this alternative maintains vertical diversity. Even though there is a focus to remove understory vegetation to reduce potential ladder fuels and surface fuels, a portion of small diameter trees would be retained where individual tree torching would not reach the crowns. The thinned overstory or less than 5 acre created opening allows understory development. All harvest prescriptions would leave an overstory of mixed tree age-classes and sizes. The stand would have a mixed age appearance with a gap in the low understory to reduce the risk of fire moving from the ground into the overstory. This action would remove a portion of the vertical diversity from the landscape within the harvest units, approximately 1,195 acres or about 6 percent of the planning area. This structure would be found in other places in the planning area and would be replaced in the harvest

units within 20 years. The loss would not affect the function of the forest landscape in providing diverse habitat.

Cumulative Effects – *Ecosystems and Diversity*

There would be no cumulative effects from recreational camping at Lugar Springs or by trail use or construction because these actions do not measurablely change vegetation characteristics at the landscape scale. Future noncommercial thinning would not change a stand's structural stage. Thinning occurs at a young stand age, when the stand is in stand initiation. The thinning allows the trees to grow more quickly and move into the next stage sooner.

Grazing within the North End Sheep and Goat Allotment is predominantly in transitional range (early plantations) and grasslands. Sheep are routed through a pasture so they are kept moving and the route changes each year so that vegetation is grazed at different times. Sheep may trample a portion of a stand within bedding areas but does not change the vegetation structure. The vegetation utilized by sheep does not impact tree cover or structural stages. There would be no cumulative effect with the proposed timber harvest from grazing activity. Currently the allotment is in non-use and may get utilized once every 3 to 4 years. This rate of grazing would not impact stand development.

Threatened, Endangered, and Sensitive Plant Species

The following is a summary of the analysis found in the Botanist Biological Evaluation and Report for the Loon Fuels Reduction Project and supplemented with additional information in the EA. The report can be found in the Project Analysis File.

There have been 13 complete species surveys conducted within and adjacent to the planning area from 1989 to 2004. Examination of the Umatilla National Forest sensitive plant coverage shows one sensitive plant species, *Botrychium minganense* (Mingan moonwort) within the Planning Area. It was documented in June of 1996 and is growing in an open area with the nearest proposed treatment over 0.1 miles away.

Carex crawfordii and *Carex interior* are two species of sedges added to the Sensitive list for Oregon in May 1999. Both species are suspected to occur on the District and are known to grow in perennially wet areas with surface water present for the majority of the year.

Silene spaldingii is listed as threatened under ESA. This species is found in open grasslands with deep Palousian soils. Habitat does not occur in this Planning Area. There would be no effect to this species.

***Environmental Effects of Alternative A to* Threatened, Endangered, and Sensitive Plant Species**
Since an action would not occur, there would be no impacts to threatened, endangered, or sensitive plant species.

***Environmental Effects of all Action Alternatives to* Threatened, Endangered, and Sensitive Plant Species**

Direct and Indirect Effects
All alternatives avoids the site of the known population of Mingan moonwort; there would be no impact to this species. It is possible that created opening or the thinning may become habitat for this plant species.

The danger tree removal and fuel reductions are proposed along Highway 204 within the Little Phillips Creek RHCA. This is potential habitat for the two *Carex* species along the perennial portions of the stream. The proposed project design feature would locate piles from west areas and exclude potentially hot, localized ground fires related to burning piles within the RHCA. The activity is not expected to impact these species or its survival.

Cumulative Effects – Threatened, Endangered, and Sensitive Plant Species

There would be no cumulative effects with other on-going or reasonable foreseeable future projects. The project avoids ground disturbance around the known location of the moonwort. There are no other actions that would occur within the Little Phillips Creek RHCA.

Pest Management (Invasive Plants)

The following is a summary of the analysis found in the Noxious Weed report for the Loon Fuels Reduction Project and supplemented with additional information in the EA. The report can be found in the Project Analysis File.

Currently 14 invasive plant species have been documented on 1, 092 gross acres (142 infested acres) of the Loon planning area. These species include: *Centaurea biebersteinii,* spotted knapweed; *Centaurea diffusa,* diffuse knapweed; *Cirsium arvense* , Canada thistle; *Cirsium vulgare*, bull thistle; *Cynoglossum officinale*, hound's tongue; *Hypericum perforatum*, St. Johnswort; *Potentilla recta*, sulphur cinquefoil; *Senecio jacobaea*, tansy ragwort; *Verbascum thapsus*, flannel mullein; and *Ventenata dubia*, Ventenata Grass.

Infested acres are the acres occupied by an invasive plant as if they fully occupy a site.

Gross acres are defined by the boundary that plants have spread over and can be grouped together as one site. The area is not fully occupied; most of the area would not have invasive plants. The difference between gross and infested acres indicates the density of the plant population.

Common vectors in spreading weeds in this area include: vehicles, big game animals, livestock; and human activities associated with camping, hunting, horseback riding, ATV and motorcycle use, and logging.

Bull thistle (*Cirsium vulgare*) and flannel mullein (*Verbascum thapsus*) have been recommended removed from the treatment priority list, because they quickly invade disturbed sites with large populations but generally get crowded out by other vegetation within 3-4 years. The painted lady butterfly (*Vanessa cardui*), a predator of bull thistle, also helps to reduce plant density. Field bindweed (*Convolvulus arvensis*) has also been recommended for removal from the treatment priority list, but it will be tracked in this project because a population occurs at the edge of a harvest unit.

An Invasive Plant Prevention Plan has been developed for this project; see Chapter 2, Project Design Features. This plan has been developed to protect ecosystems from the impacts of invasive plants and minimize the creation of conditions that favor the introduction of invasive plants. Prevention measures in the plan focus on control or condition of equipment, education about the invasive species and their location, and management guidelines to not create conditions favorable to high priority invasive species.

Environmental Effects of Alternative A to Invasive Plants

There would be no change to existing rates of spread and establishment of new sites or species. Current vectors from the spread of weeds remain unchanged. Contract or permitted activities would have prevention plans to reduce the risk of spread.

Environmental Effects of all Action Alternatives to Invasive Plants

Direct and Indirect Effects

Vectors, ground disturbance, and amount of plant cover are the primary risk factors associated with the spread of invasive plants. The Invasive Plant prevention Plan has been developed to control the proposed operations to reduce the risk of establishing or spreading new invasive plants in the Planning Area. Equipment used for logging, felling, slash treatments (including ATV), and road maintenance would be cleaned and kept clean between units or work sites. Vehicles would not park on or in invasive plants. When an action is adjacent or near a site, exposing soil would be avoided. Road maintenance would be accomplished to avoid the spread of invasive plants and a vigorous herbaceous cover would be encouraged along road edges. The proposed prescriptions would also leave a canopy that reduces the potential for establishment of invasive plants. Prevention measures are the primary defense from the impact of invasive plants.

Soil disturbance would be reduced by use of the processor forwarder logging system because soil cover is retained. Past monitoring indicates that 2 to 4 percent of the area logged would have exposed soil. The areas are never large and are mainly associated with landings or high use trails. Since logs are decked without clearing an area, ground cover is retained reducing available sites. Helicopter and skyline logging would disturb even less ground, retaining nearly 100 percent of the natural cover as a deterrent for the spread of invasive plants. The proposed piling and burning would create disturbed areas of exposed soil that would be revegetated. When mastication is used, exposed soil would be reduced by the chipped wood being spread over the surface and the low ground pressure would keep soil disturbance minimized and confined to small areas.

With the exception of the 25 acres of small patch cuts, the actions would retain forest cover. The five acre patch cuts would be distant from roads and shading from edges would reduce available habitat for invasive plants. Even the disturbance within the units associated with logging trails would be shaded, reducing establishment of invasive species. The combination of prevention measures would be effective in reducing the risk to spreading invasive plants through avoidance, keeping equipment clean of seeds, and retaining soil and canopy cover.

Cumulative Effects

The Forest Plan requires every activity to have an Invasive Plant Prevention Plan. This plan reduces the risk for the spread of invasive plants in the Planning Area. Recreation activities associated with road use would continue to be a vector for the spread of invasive plants until these sites are effectively controlled. Currently the sheep allotment is in non-use. Should sheep return to the allotment, the prevention measures associated with the timber harvest, fuel treatments, and noncommerdical thinning would retain environmental features not conducive for the spread of invasive plants. Cumulative effects with grazing is not expected to increase the rates of spread. The integrated approach to invasive plant control should keep the planning area at low rates of spread and through invasive plant treatments, reduce the amount of invasive plants in the planning area.

Visual Quality

Existing Visual Quality Conditions

The Planning Area contains approximately 600 acres of Forest Plan Management Area A3 – viewshed 1 along Highway 204. The area is primarily highly sensitive foreground of common variety class with a visual quality objective of retention. Visual quality objectives in the middle ground is partial retention. A3 would be managed as a natural appearing landscape. Vegetative manipulation would be conducted so that forest management activities are not noticeable in the foreground and remain visually subordinate in the middle ground. Forest stands would be occasionally logged in order to maintain long-term health and vigor, and to encourage park-like, natural appearance with big trees in the immediate foreground. The viewshed should have a mix of size classes of trees with an emphasis on viewing large trees and multi-aged stands. Created opening size would range from one to two acres for uneven-aged management objectives, and 3 to 10 acres for even-aged objectives. The percent of created openings would range from 8 percent in retention to 20 percent in partial retention. There currently are no created openings in management area A3 within the Loon planning area. Past harvest included 160 acres of salvage for the removal of danger trees in the early 1990s, 35 acres of commercial thinning in the middle ground near the ridgetop, and a 40 acre area with less than 2 acre openings as part of unevenaged management group selection harvest. All harvest prescriptions where for uneven-aged management objectives. Since 1962, there has been 266 acres of timber harvest in A3, 253 of it since 1981, 63 percent of this was danger tree removal.

Environmental Effects to Visual Quality

Environmental Effects of Alternative A to Visual Quality

Visual quality within Management Areas A3 would continue with the current trends. Dead trees would continue to fall to the ground creating heavy fuel conditions along the highway. Stressed induced mortality caused by heavy stocking levels of ponderosa and Douglas fir would continue. The area above the highway would have a natural appearance; however, the open dry forest character would be lost. No changes in visual quality along Highway 204 are expected. Blowdown would likely continue during the winters.

Environmental Effects Common to all Action Alternatives to Visual Quality

Direct and Indirect Effects

The impacts associated with the harvest prescription to visual quality would be similar for each alternative, only the size of area impacted would change. Table 3-22 shows the amount of acres proposed for harvest by presription for each alternative within Management Area A 3.

Table 3-22 Proposed Harvest in A3

Altternative	Improvement Harvest	Commercial Thinning	Total Harvest
B	141 acres	9 acres	150 acres
C	530 acres	9 acres	539 acres
D	346 acres	9 acres	355 acres

Commercial thinning is proposed in Units 39 and 41. The thinning would occur along the ridgetop north of FR 3727020, a ridgetop road. Harvest and stumps would not be visible from the highway because it would be located on top of the ridge, a quarter mile from the highway and screened by the forest on the slope above the highway.

Both improvement harvest and danger tree removal would occur in the foreground and background view of the highway. Unless there is a major pocket of dead or dying trees, improvement harvest would not create an opening and would meet Forest Plan standards for created openings. These unevenaged prescriptions are compatible with the visual quality objectives for A3, see Forest Plan page 4-101. Visual impacts associated with the cutting and removal of danger trees would be minimized by the protection measures for the RHCA. There would be low levels of ground disturbance near Little Phillips Creek and using a skyline or helicopter logging system would allow vegetation to recover quickly, within 6 weeks of any disturbance. The hand piling of fuels within the background area would reduce the visual impacts of leaving large concentrations of slash and fuels. The improvement harvest prescriptions would complement the landscape forms and features along the highway such that the thinned landscape would appear natural, other than occasional stumps viewed from the highway. When harvest is completed the slope above the highway would have an open appearance allowing the viewing of large trees. Other than an occasional danger tree, harvest prescriptions would not cut and remove large trees greater than 21 inches. Stumps near the highway would be cut so they are visually subordinate. Though the area proposed for harvest is large, the prescription is easily adjusted to the location on the landscape and would blend with natural features. The landscape above the highway is a mosaic of forest and grasslands. The timbered stands would not change in size, but would be reduced in canopy closure. The logging operation would be visible in the foreground for several years until brush and herbaceous plants cover the stumps and disturbed sites (approximately 3 years). In the middle ground, consisting of the slope above the highway, the thinned crowns would be what is expected to be seen for dry forest pondersosa pine/Douglas fir forests and be visually subordinate.

Cumulative Effects – *Visual Quality*

There are no reasonable foreseeable future actions or on-going actions that would contribute to cumulative effects with the proposed harvest. The highway would require cutting of danger trees and removal where they pose a threat to public safety or the stability of the highway. These would be infrequent and short term. Any severe event would be considered catastrophic under forest plan guidelines and have a recovery plan prepared.

Timber

Existing Timber Conditions

Timber harvest has occurred in the Planning Area since the 1960s with the last timber sale occurring in the late 1990s. There has been approximately 11,550 acres of timber harvest in the Planning Area, most of it using partial removal (uneven-aged) prescriptions (See table 3-23). Records indicate that of this harvest 1,970 where last harvested in the 1960s, 4,970 in the 1970s, 1,880 acres in the 1980s, and 2,730 acres in the 1990s. Approximately 840 acres of the clear harvest occurred in the 1960s and most of the harvest in the 1980s utilized even-aged management, predominately shelterwood harvest.

Table 3-23 Current Acres of Timber Harvest in Planning Area by Prescriptions

Regeneration harvest total (even-aged)	**3,858 acres**
Shelterwood	968 acres
Clearcut	1,347 acres
Patch clearcut	196 acres
Seed tree	377 acres
Overstory Removal	970 acres
Improvement harvest total (uneven-aged)	**7,692 acres**

Single tree selection	1,174 acres
Group selection	292 acres
Commercial thinning	3,320 acres
Sanitation	1,973 acres
Salvage	542 acres
Partial removal	21 acres
Improvement	370 acres
Total harvest in Planning Area	**11,550 acres**

The Forest Plan goal is to provide for production of wood fiber consistent with various resource objectives, environmental constraints, and considering cost efficiency. The Forest Plan established Management Areas and Standards and Guidelines to accomplish various resource management objectives. Current Forest Plan Management Areas are: A2 OHV Recreation, 123 acres; A3 – Viewshed 1, 615 acres; A5 – Roaded Natural, 135 acres, C1 – Dedicated Old Growth, 678 acres; C2 Managed Old Growth, 350 acres; C4 – Wildlife Habitat, 5,657 acres; C5 Riparian Wildlife, 624 acres; and E2 – Timber and Big Game, 12,005 acres. Timber is not managed on a scheduled basis in Management Areas A2, C1, and C2, 1,151 acres, and no harvest is being proposed in these management areas. The selected silvicultural systems will be guided by the following criteria (see pages 4-67 and 4-68 of the Forest Plan):

- Selected method must produce a volume of marketable trees.
- Selected method must use available and acceptable logging methods.
- Selected method must be capable of meeting special management and multiple-use objectives.
- Selected method must permit control of vegetation to establish desired species composition, density, and rates of growth.
- Selected method must promote stand structure and species compositions that minimize risks from insects, disease, and wildfire.
- Selected method must assure that lands can be adequately restocked.
- Selected method must be practical and economical in terms of transportation, harvesting, preparation, and administration of timber sales.
- The planning area is in the North Associated Group; strong consideration should be given to maintenance of stands dominated by early successional species including ponderosa pine, Douglas-fir, western white pine, and western larch.

Environmental Effects to Timber

Environmental Effects of Alternative A – No Action to Timber: Permitted goals and objectives of the Forest Plan would not occur. The build up of fuels and complexity of stand structure would continue placing most of the planning area at risk for uncharacteristic wildfire or insect damage. The fuel conditions and associated risk for stand replacement wildfire is expected to increase over the landscape. Without silvicultural treatments, early seral species would not regenerate. The desired species and stocking levels would not be achieved for a resilient landscape to disturbance events such as wildfire, insects, or root rots. As stocking levels increase the resilience provided by early seral species would continue to be lost from the landscape.

Marketable volume of trees would be lost as the larger diameter trees die from insects and are not utilized. Other multiple-use objectives would be lost; habitat would become more uniform in structure and composition and forage for sheep grazing and big game would be reduced. The current stocking

would produce more cubic feet of volume than thinned stands, however the trees would remain small. The thinning that promotes growth and vigor would be lost.

Environmental Effects Common to all Action Alternatives to Timber Resources

Direct and Indirect Effects

All action alternatives would produce marketable volume that would meet utilization standards using logging systems acceptable to the Forest Plan and able to meet protection measures found in the standards and guidelines. Prescriptions would reduce both down and aerial fuels and stand stocking levels while increasing growth and vigor producing future merchantable trees. Where early seral species are present, stand management would favor their continued development. Alternative B would harvest 5,060 mbf; Alternative C, 6,010 mbf; and Alternative D and E, 2,900 mbf. The proposed logging systems, cut to length and helicopter or skyline, have been used on the district in the past and are easily available as well as equipment used for mastication. These systems provide acceptable resource protection with much lower impacts than conventional ground skidding.

The silvicultural objectives for harvest units would increase early seral tree species on the landscape. Early seral species would be the preferred leave trees in all stands, particularly when the objective is for fuel reductions. Table 3_24 displays the stand objectives of prescriptions for each alternative.

Table 3-24 Vegetation Prescription Objectives

Silviculture Objective	Alternative B	Alternative C	Alternative D
Management of western larch	431	431 acres	
Stocking level control	375	355 acres	
Fuels Reduction	1,118	1,380 acres	1,195
	1,924	2,166	1,195
Estimated Advertised Rate for timber	249,710	183,640	- 7,420

Stocking level control, either by noncommercial or commercial thinning, would allow trees to grow larger, quicker and move the stands to mid succession stage at an earlier age. The larger trees would produce higher quality fiber providing more uses than trees from overstocked stands. High stocking levels would produce more cubic feet of fiber but from small diameter trees. By managing stands within the recommended stocking levels, 72 to 85 percent of the potential gross cubic volume growth at full stocking levels would be captured. Cubic volume production would be lost but the social and monetary value associated with large trees would increase and the probability of severe mortality from insects greatly reduced. Managing for remnant large trees reflects a volume loss over the Forest Plan's even-aged management focus; however, the large trees provide resilience to wildfire because they have the greatest chance of surviving the event and move stands to old forest structure more quickly.

Past harvest in this area shows no problems with reforestation. Regeneration units have reforested within the required five years. The regeneration in stands managed for open or single stratum conditions would not be uniform as in a plantation. The uneven-age managed stands would have a mosaic of age classes. Single stratum stands would have lower stocking levels than even aged plantations. Grass and brush would contribute a larger share of site productivity than current conditions. Fire disturbance processes or harvest would keep the stands in open conditions, producing larger trees and less cubic volume than would be produced by even aged management.

The estimated advertised rate gives a relative measure of how economical each alternative is and whether the timber sale would be able to provide funds for improvement projects. This estimate is based on local average costs for each logging systems. Alternatives B ($249,710) and C ($183,640) produce positive values while Alternative D (-7,420) is considered deficit because it would be below base rates. Though Alternative C has more volume, it also has a high proportion of more expensive helicopter logging mainly along Highway 204. Helicopter and forwarders where used for the logging costs. Helicopter logging is more expensive than normal skyline. Much of the volume proposed for skyline would require a multispan system which is nearly as expensive of helicopter. Helicopter /skyline logging makes up approximately 28 percent of the volume in Alternative B, 44 percent of Alternative C, and 72 percent of Alternative D. The proposed fuel reduction in helicopter/skyline unit 42 provides, about 55 percent of the helicopter volume in Alternative C and D, provides important treatments for protection of the Palmer Valley WUI from a wildfire coming from the highway as well as the escape route. The proposed harvest is needed to increase the height to crown and lower the severity of a wildfire by reducing surface fuels. The helicopter units work together with the ridgetop units to control the size of wildfires and allow safe and efficient fire suppression actions. The difference between Alternative B and C is the cost of fuel reductions along Highway 204, approximately $66,070. This is a small cost to allow an engine crew to suppress a fire at eight acres or less. Should a wildfire spread up this slope becoming large, great than 600 acres, the suppression costs would be over a million dollars. Over the past five years the District has had 600 to 4,000 acre wildfires in similar vegetation types. Access to a wildfire is easier in this planning area, however, if a wildfire reached 100 acres, it would likely be larger than 2,000 acres by the time control is achieved.

Should Alternative D be implemented the advertised rate would cover costs needed to reforest. Money to cover improvement projects and fuel reduction would have to come from other sources, unless there happens to be an overbid. The fuels reduction would still occur, but at a higher cost to the government, the sale of timber offsets the cost of fuels reduction. The timber removed as part of the proposed fuel reductions and stocking level reductions provides other resource values related to, resilience of the forest to wildfire or outbreak of insects and increasing tree vigor while easing control of wildfires and increasing fire fighter safety, providing protection measures for the Palmer Valley Wildland/urban interface.

Cumulative Effects Timber - All action alternatives provide for varying degrees of multiple uses while meeting the goals of the Purpose and Need. Specific effects to resources are discussed in other sections of this chapter. Resource protection is provided through various design features, the proposed logging systems, and fuel treatment methods. Forwarders and helicopters/skylines have low impacts to soil and water quality and the no harvest or ignitions within RHCAs (except Little Phillips Creek) provides additional protection and maintains riparian functions. RHCAs would be allowed to continue developing under the current conditions, those with high mortality from insects would be at risk for catastrophic wildfire, but effects would be buffered by the fuel reductions occurring adjacent to them. Design Features for Fish and Water Quality, Wildlife, Control of Logging, Noxious Weeds, and Prescribed Fire should be effective in reducing impacts to these resources.

Multiple-use benefits include:

- Improve grazing without reliance of transitory range developed under even-aged management strategies.
- Utilization of timber. Harvest volume by Alternative B, 5,060 mbf; Alt C, 6,010 mbf; Alt D and E, 2,900 mbf.
- Fuels would be reduced providing a mosaic of fire intensities that could be used to control the size of a wildfire. This should increase resilience and lower resource impacts when a

wildfire occurs in the planning area. Acres of Total Fuel Reduction: Alternative B, 2,075; Alternative C, 2,212 acres; Alternative D, 1,195 acres. Both Alternative C and D provide a focus on the Highway 204 corridor.

- Thinning the stands would improve stand vigor, growth, and resilience to insect attack and wildfire, also protecting multiple resource values. Total acres treated: Alternative B, 1,194 acres; Alternative C, 2,166 acres; Alternative D 1,195 acres.
- Increases fire fighter safety by reducing surface and ladder fuels and increasing the ease to control a wildfire.
- The modified fuel and stand structure along Highway 204 would help reduce the intensity of a wildfire moving from the highway into Palmer Valley WUI. Alternative B treats 177 acres along the highway; Alternative C treats 631 acres and Alternative D, 446 acres.
- Improved road drainage and safety by maintenance, surface replacement, and removal of danger trees.

Transportation System: Goal; Provide and manage a safe and economical road and trail system and facilities needed to accomplish the land and resource management and protection objectives on the Umatilla National Forest.

Existing Road System: The project area is accessed via Forest Roads 3725 and 3727 from State Highway 204 and from FR 6300 to Luger Springs in Lookingglass Creek. There are 80 miles of road in the planning area including 3.7 miles of State Highway 204. The Walla Walla District Access and Travel Management Plan designates 29 miles as open, 3 miles as restricted, and 38 miles as closed. All roads in the planning area are seasonal roads for the purposes of winter recreation. Open roads are available and maintained for passenger vehicles; other roads would require high clearance vehicles.

There are 26.2 miles of native surface roads of which 5 miles are open. There are 61.7 miles of aggregate surface and 5.4 miles of paved. There are 45.3 miles of maintenance level 1; 36.5 miles of maintenance level 2; 8 miles of maintenance level 3; 4.5 miles of maintenance level 4; and 5.4 miles of maintenance level 5. Yearly maintenance occurs on level 4 and 5 roads. Many of the roads have not been used for many years and need log out, brushing, surface rock replacement, installation of cross drains, and ditches cleaned.

Total road density for the planning area is 2.9 miles per square mile with an open road density of 1.5 miles. Road density for Management Area C4 is 1.4 miles per square mile with an open road density of 0.4 miles. The total road density of Management Area E2 is 4.6 miles per square mile with an open road density of 1.4 miles.

***Environmental Effects of Alternative A - No Action* to Road System**

Direct and Indirect Effects - Existing problems and degrading road conditions would continue to impact water quality. Base material would move to the surface, increasing the suspension and transport of fine sediment off the road. Surface blading would become more difficult resulting in improper drainage and rutting of the road surface. Road maintenance on closed roads, spot reconstruction, and surface rock replacement would not occur. These improvements are needed for drainage improvements, the prevention of future damage, and public safety. Drainage related problems would not be corrected until an event occurs that causes a failure with associated resource damage, particularly to water quality. Damage is often discovered a month or more after the event. The cost for repairs is often higher than maintenance because more extensive repairs are needed. Public safety risks are associated with narrowing of the road and possible debris flows. The lack of maintenance and reconstruction increases the risk for detrimental damage to resources.

Environmental Effects Common to all Action Alternatives to Road System

Direct and Indirect Effects - Public safety would be improved by surface rock replacement, surface blading, and brushing of encroaching vegetation. The addition of surface rock would harden the road surface and allow it to weather better and reduce rutting and sediment movement. Sight distances would be improved by brush removal.

Impacts to water quality would be reduced by maintenance and reconstruction projects. Hardening the road surface or resurfacing the road reduces sediment yields; Research by Burroughs and King 1989 indicated four inches of 1.5 minus gravel can reduce sediment production by 79 percent compared with native surface. Construction of drainage dips or waterbars on closed road systems shortens the distance water moves along roads spreading drainage water over shorter distances and allowing overland flow to be filtered or absorbed into the soil. The proposed repairs or surface changes are needed to avoid the high cost of major repairs from road failures while providing a safe road for public and commercial travel. The proposed 25 to 31 miles of road maintenance would also improve drainage. When hauling is completed, the roads would be self-draining with additional cross drains. Replacement of surface rock and improved drainage reduces maintenance costs and potential sediment production from these non-point source sites.

The 1,800 feet of temporary road would not change road densities in the planning area because it would be used for a short time and decommissioned. The road would be used to treat slash, but would be decommissioned afterward, within 5 years after use for timber harvest. The temporary road is located behind a closed gate; FR 3725035 is a closed road system, there would be no change in Forest wide open road density. There are no changes proposed to the access and travel management plan.

Cumulative Effects – Timber harvest and log haul would have a short term impact to ATV users in the Luger Springs area; likely confined to one summer season. Roads would be closed to public use while the timber sale is operating. Traffic use associated with the sheep allotment is light; associated with camp access. Sheep can be routed and bedding areas placed such that the timber operation would have no cumulative impacts with range use. Large trucks used for moving sheep on and off the allotment would be on forest over one to three day period and would not occur in the planning area. The proposed harvest would not impact the Eagle-Luger Motorized Trail. Unit 35 is near the trailhead and warning signs would be placed where the trail is adjacent to the unit or temporarily closed during the felling and yarding operation. Haul associated with the harvest would not impact snowmobile use because the roads would be closed Dec 1 to March 31.

Range: Goal: To manage the forage resources for an upward vegetation trend in areas in "less than fair" condition and an upward or stable trend for areas in "fair" or better condition, while providing for forage productivity and making suitable range available for livestock grazing. Increase the level of forage production where cost efficient and consistent with resource goals.

The Northend Sheep and Goat Allotment is currently in non-use. This analysis does not propose any changes to the existing grazing allotment. Pastures are used June 1 to Oct 9 and rested every fifth year.

Alternative A - No Action

Direct and Indirect Effects - Grazing trends would continue unchanged. Monitoring indicates that overgrazing is not occurring in natural meadows and transitory range provides adequate forage.

Currently the range permit allows a maximum of 3,962 ewe/lambs from June 1st to October 9th. The allotment is approximately 132,089 acres. The allotment was grazed in 2006 and was rested in 2003, 2004, 2005, and in 2007.

Over the next five to ten years plantations making up transitory range would no longer provide forage, sheep may compete for grasses produced in natural meadows with big game. Currently there are 1,744 acres of plantations less than 30 years old that provide transitory range. Approximately 33 percent of the transitory range would be lost in 10 years and 86 percent would be lost in 15 years.

All Action Alternatives

Direct and Indirect Effects – Historically, logging operations have not been a problem for sheep. Logging and routing schedules would be coordinated so the logging operations would not interfere with the timing of grazing. The operator is required to protect improvements such as fence lines, cattle guards, and watering developments.

Cumulative Effects - Monitoring plots in natural meadows do not show over-grazing where sheep compete with big game. Years of monitoring show a stable trend. Utilization has remained the same. Management actions in the frequent and mixed fire regimes would increase transitory range and available forage. Improvement harvest and thinning would reduce stand densities creating open stand conditions favorable to the production of forage.

Table 3-25 Treatment Acres to Create Open Forest Conditions and Available for Grazing in Ten Years

Alternative	Acres of Improvement harvest	Patch Cut	Total Acres Available for Grazing
B	1,245	75	1,320
C	1,749	25	1,774
D	859	0	859

Management requirements listed in Chapter II would reduce conflicts between grazing, timber harvest, and landscape prescribed fire. The burning would stimulate grasses and the forage made available the following spring and summer. The prescribed fire should not impact the timing and use of the grazing units.

Compliance with other Laws Regulations and Policies

This section describes how the action alternatives comply with applicable State, and Federal laws, regulations, and policies.

National Historic Preservation Act

A review of the Umatilla National Forest heritage files indicate that the majority of the Loon Analysis Area has been surveyed. A total of 29 surveys have taken place and are considered adequate, conducted in accordance with guidelines established by the Umatilla National Forest Cultural Resources Inventory Plan. Three separate areas within the Planning Area, totaling 1,422 acres, have not been surveyed.

There are no activities proposed within the unsurveyed areas. As a result of these surveys, a total of forty-eight sites were located and recorded. Twenty-nine of these are considered isolated finds and are not considered eligible for listing in the National Register of Historic Places (NRHP). The remaining nineteen sites consist of seven historic site types and twelve prehistoric sites. The balance of Euro-American affiliated site types within the analysis area are generally related to Forest Service administration activities, while several sites relate to grazing activities. The pre-contact sites are evidence for tool manufacturing activities that may be related to hunting and root and berry collection. The nineteen sites are considered eligible to the NRHP and will be protected from all project activites associated with the Loon Fuel Reduction Project. None of the sites are within proposed activity areas; however, two sites are adjacent and will be monitored prior to implementation to ensure avoidance.

Consultation with appropriate tribes has taken place throughout the planning stages of the project.

Avoidance measures will be implemented where necessary, per Stip.IIIB.2 (a-d) of the Programatic Agreement between the Advisory Council on Historic Preservation (ACHP), the Oregon State Historic Preservation Officer (SHPO), and the United States Forest Service (USFS) Region 6, signed June 6, 2004. Because heritage resources will be avoided by the proposed project activities under any of the proposed alternatives, there will be no effect to any property listed in, or eligible to the NRHP. Documentation to this effect will be forwarded to the Oregon SHPO, in compliance with the National Preservation Act of 1966 (as amended), 36 CFR 800.4 and the Programmatic Agreement.

Disclosure Statement for Compliance with the Migratory Bird Treaty Act (MBTA) and Executive Order 13186

Activities comply with the Fish and Wildlife Service Directors order #131 related to applicability of the Migratory Bird Treaty Act to federal agencies and requirements for permits for “take”. In addition, the permit is compliant with Executive Order 13186 because the analysis meets our obligation as defined under the January 16, 2001 Memorandum Of Understanding between the USDA Forest Service and USDI Fish and Wildlife Service designed to complement Executive Order 13186. The purpose of this Memorandum of Understanding is to strengthen migratory bird conservation through enhanced collaboration between the Forest Service and the Fish and Wildlife Service, and with state, tribal, and local governments. As required, management practices that could affect high priority species have been identified, and conservation measures to minimize impacts to birds have been considered.

Endangered Species Act and Regional Forester's Sensitive Species

Biological Evaluations for “endangered”, “threatened”, and “sensitive” plant and animal species were completed for those species currently listed as sensitive on the Regional Forester's Sensitive Species List (dated November 15, 2000 for fish and wildlife and dated May 1999 for plants). Determinations were made that none of the proposed projects would adversely affect, contribute to a trend toward Federal listing, nor cause a loss of viability to the listed plant and animal populations or species.

With regards to threatened and endangered species, a determination has been made and displayed in Table 3-26. The rationale for determinations are found in the Wildlife Habitat, Riparian and Fisheries Habitat, and Ecosystem and Diversity sections of this EA. The proposed actions will not result in irreversible or irretrievable commitment of resources that foreclose formulation or implementation of reasonable or prudent alternatives. When the proposed action was determined to “may effect, not likely to adversely affect” ESA listed species, appropriate consultation with the regulating agency (Fish and Wildlife Service and National Marine Fisheries Service) occurred and they concur with the finding.

Table 3 – 26. Summary of Effects for Threatened, Endangered, and Sensitive Wildlife Species

Species	Status	Species Occurrence and Habitat Suitablility	Alternative			
			A	B	C	D
Terestrial Species						
Gray wolf *Canis lupus*	Endangered	Potential	No Effect	No Effect	No Effect	No Effect
Canada lynx *Lynx canadensis*	Threatened	Potential	No Effect	No Effect	No Effect	No Effect
Bald eagle *Haliaeetus leucocephalus*	Sensitive	Potential	No Effect	No Effect	No Effect	No Effect
California Wolverine *Gulo gulo*	Sensitive	Potential	N I	N I	N I	N I
Lewis' woodpecker *Melanerpes lewis*	Sensitive	Potential	N I	N I	N I	N I
Peregrine falcon *Falco peregrinus*	Sensitive	No Nesting Habitat	N I	N I	N I	N I
Upland sandpiper *Bartramia longicauda*	Sensitive	No Habitat	N I	N I	N I	N I
White-headed woodpecker *Picoides albolarvatus*	Sensitive	Potential	N I	N I	N I	N I
Columbia spotted frog *Rana luteiventris*	Sensitive	Potential	N I	N I	N I	N I
Inland tailed frog *Ascaphus montanus*	Sensitive	Potential	N I	N I	N I	N I
Painted turtle *Chrysemys picta*	Sensitive	No Habitat	N I	N I	N I	N I
Northern leopard frog *Rana pipiens*	Sensitive	No Habitat	N I	N I	N I	N I
Aquatic Species						
Snake River fall Chinook salmon *Oncorhynchus tshawytscha*	Threatened	none in the project watersheds	NE	NE	NE	NE
Snake River spring/summer Chinook salmon *Oncorhynchus tshawytscha*	Threatened	Lookingglass Creek Grande Ronde River – Cabin Creek	MANLA	MANLA	MANLA	MANLA
Snake River steelhead trout *Oncorhynchus mykiss*	Threatened	Lookingglass Creek Grande Ronde River – Cabin Creek	MALAA	MALAA	MALAA	MALAA
Middle Columbia River steelhead trout *Oncorhynchus mykiss*	Threatened	none in the project watersheds	NE	NE	NE	NE
Redband trout *Oncorhynchus mykiss*	Sensitive	Lookingglass Creek Grande Ronde River – Cabin Creek	MII	MII	MII	MII
Westslope cutthroat trout *Oncorhynchus clarki*	Sensitive	none in the vicinity of the project	NI	NI	NI	NI
Margined Sculpin *Cottus marginatus*	Sensitive	none in the project watersheds	NI	NI	NI	NI

Species	Status	Species Occurrence and Habitat Suitablility	Alternative			
			A	B	C	D
Pacific Lamprey *Lampetra tridentata*	Sensitive	none in the project watersheds	NI	NI	NI	NI
Columbia River Bull trout *Salvelinus confluentus*	Threatened	Lookingglass Creek Grande Ronde River – Cabin Creek	MANLA	MANLA	MANLA	MANLA
Coho Salmon *Oncorhynchus kisutch*	Threatened	none in the project watersheds	NE	NE	NE	NE
Columbia River spring Chinook salmon *Oncorhynchus tshawytscha*	Threatened	none in the project watersheds	NE	NE	NE	NE
Botanical Species						
Mingin moonwort *Bytrychium minganense*	Sensitive	One population found in planning area	NI	NI	NI	NI
Carex crawfordii	Sensitive	Habitat present	NI	NI	NI	NI
Carex interior	Sensitive	Habitat present	NI	NI	NI	NI
Regionally Listed Species	Sensitive	None	NI	NI	NI	NI
Silene Spaldingii	Threatened	No habitat in planning area	NE	NE	NE	NE

NE No effect on a proposed or listed species or critical habitat
MANLA May Affect Not Likely to Adversely Affect
MALAA May Affect Likely to Adversely Affect
NI No Impact to R6 sensitive species individuals, populations, or their habitat
MII May impact individuals or habitat but not likely to contribute to a trend towards federal listing.

Wetlands and Floodplains

Executive Order (EO) 11988 requires the Forest Service to avoid "to the extent possible the long and short term adverse impacts associated with the occupation or modification of floodplains…" The proposed alternatives would avoid all floodplains and affects to floodplains and is consistent with this EO.

Executive Order (EO) 11990 requires the Forest Service to "avoid to the extent possible the long and short term adverse impacts associated with the destruction or modification of wetlands." The proposed alternatives would avoid all wetlands and affects to wetlands and is consistent with this EO.

Clean Water Act Compliance

There have been many delistings in the Upper Grande Ronde sub-basin based on evaluation that habitat modification and flow modification parameters may be water quality limiting but are not pollutants. Approval of the Upper Grande Ronde TMDL in 2002 resulted in temperature and sediment delistings at

that time. Some new listings have occurred since then. Current 303d listed water quality impairments are found in Table 3.

Table 3 Water Quality Impaired Streams ODEQ 303d List Category 5

Listing Parameter	Listing Criteria
Grande Ronde River; Water Temperature, Year-round salmon and trout rearing and migration.	18 ° C 7 day average max temperature. Receiving waters.
Grande Ronde River; Dissolved Oxygen, salmon and steelhead spawning.	Not less than 11.0 mg/L or 95% of saturation Jan. 1-May 15. Receiving waters.
Grande Ronde River; sedimentation, undefined	Criteria as above. Receiving waters.

The Umatilla National Forest incorporated protection of water quality as an important management goal and explicitly set ground disturbance and shade standards to protect it in the 1990 Land and Resource Management Plan. In the mid 1990s PACFISH amended the plan by adding Standards and Guides and RHCA protections designed for, among other objectives, maintenance and recovery of shade and morphology components (including sediment regime) of water temperature. Managing to these standards has protected ground cover and existing shade and allowed for recovery of those elements at near natural rates for a decade. Restoration work aimed at reducing sediment sources through road decommissioning has been ongoing, much of it occurring since the floods of 1996 and 1997.

The Umatilla National Forest has a high rate of compliance with BMPs. School Fire Salvage EIS RHCAs were monitored in 2006. Buffers on 18 units, 23 percent of identified RHCA influence units, were monitored in July and August 2006. Results are displayed below. Average buffer widths exceeded standards for all stream categories.

Table 3-27 Average Buffer Width by Stream Category School Fire Salvage Sales

	Average (ft)	Number of Measurements	PACFISH Standard
Fish Bearing Streams	325	32	300
Perennial Non Fish Bearing	187	59	150
Intermittent	150	87	100
Dissected Ephemeral	36	34	No standard BMP = 25'

RHCA effectiveness was also measured and reported in 2001 as follows: no cases of erosion or sedimentation were observed post harvest in RHCAs.

Identification of BMPs for the proposed projects has occurred and any project which might occur in this planning area would be considered for monitoring in the Umatilla National Forest annual BMP monitoring plan. These activities would not detrimentally affect beneficial uses. Riparian and channel components that protect water quality would be maintained. Other design criteria and BMPs would control disturbance that could lead to erosion and sedimentation. Effects of proposed actions would not adversely or measurably affect water temperature**.** Short term measurable turbidity effects could occur during removal of a temporary culvert. Best Management Practices have been incorporated into the project design criteria for the culvert removal and will be monitored. The proposed project is in compliance with the Clean Water Act.

Municipal Watersheds

Chapter 4

Supporting Information

Chapter 4

Consultation and Coordination

Scoping and 30-day Comment Period

Scoping letters were sent to the mail list of interested parties maintained at the Umatilla National Forest Supervisor's Office. This included the Confederated Tribes of the Warm Springs Reservation of Oregon, The Confederated Tribes of the Umatilla Indian Reservation, and Oregon Department of Fish and Wildlife.

Tribes

Confederated Tribes of the Umatilla Indian Reservation

Antone Minthorn – Chairman

Armand Minthorn, Cultural Resources Committee Chairman

Teara Farrow, Cultural Resources Protection Program, Acting Program Manager

Carey Miller, Cultural Resources Protection Program, THPO

Eric Quaempts, Department of Natural Resources, Director

John Barkley, General Council Chair

Rick George, Environmental Planning, Rights Protection Dept.

Carl Scheeler, Wildlife Program Director

Gary James, Fisheries Program Director

Confederated Tribes of the Warm Springs Indian Reservation

Ron Suppah, Tribal Chairman

Delvis Heath, Sr., Warm Springs Chief

Nelson Wallulatum, Wasco Chief

Joseph Moses, Paiute Chief

Bobby Brunoe, Natural Resources Program General Manager/ THPO

Sally Bird, Cultural Resources Program Manager

Scott Turo, Off-Reservation Habitat Biologist

Nimiipuu Tribe

Samuel N. Penny, Chairman

Keith Lawrence, Wildlife Management

Loren Kronemann, Nez Perce Tribe

Ira Jones, Watershed Management

Ryan Sudbury, Office of Legal Council

Dave Johnson, Fisheries Division

Aaron Miles, Natural Resources Division

Randall Minthorn Chairman, Natural Resources Subcommittee

Brooklyn Babtiste, Vice Chairman, Natural Resources Subcommittee

Vera Sonneck, Cultural Resources Program Director

Government Agencies

Bureau of Indian Affairs

Jim Lauer,

Cooperative Extension Service

Randy Mills, Extension Agent Umatilla County

Grant County

Soil and Water District

Oregon Department of Fish & Wildlife

Tim Unterwegner

Steve Cherry

Kevin Blakely

Tim Bailey

Mark T. Kirsch

Habitat Conservation Division

Oregon Department of Environmental Quality

Oregon Department of Forestry

David Morman

David King

Oregon Division of State Lands

Fern Shank

National Marian Fisheries Service

Spencer Hovekamp

Umatilla Basin Watershed Council

Tracy Bosen

Umatilla County

Tom Johnson – Watermaster, District 5

Union County

Board of Commissioners – Colleen Macleod, Steve McClure, John Lamoreau

U.S. Environmental Protection Agency, Region 10

Michael Letourneau

U. S. Fish & Wildlife Service

John Kinney

Portland Field Office Field Supervisor

Universities

University of Oregon, Environmental Studies Center

Western Washington University – Robert Lopresti, Documents Department, Wilson Library

Industry

Associated Oregon Loggers, Inc.

Blue Mountain Lumber Products – Bill Cameron

Boise Cascade Corporation – Tony Steenkolk, John Warness

Columbia helicopters – Max Merlich

Crum Farming – Monty Crum

Henderson Logging Inc. – James E. Henderson

Joe Cook Logging

Kinzua Resources LLC – Bob Broden / Andy Munsey

KLE Enterprises Inc. – Ken Evans

Malheur Lumber Company – Walt Gentis

Oregon Log and Fiber – Tim Always

Pine Creek Logging – Don Barnett

Three Valleys Ranch Fossil Property – John Aaron

Organizations

Adopt-A-Forest – Judith Johnson

American Forest Resource Council – Chuck Burley

ATV-AAC – Pat Harris

Blue Mountains Biodiversity Project – Karen Coulter

Center for Tribal Water Advocacy – Hal Shepherd

Columbia River Inter-Tribal Fish Commission – Jim Weber

Desert Rats – Brigit Mudd

Eastern Oregon Protection Association – Lynn Breese

East Oregonian – Barry Rockford

Forest Service Employees for Environmental Ethics – Forest Fleischman, Policy Advocate

Greystone – Amber Martin

Hells Canyon Preservation Council – Greg Dyson

Inland Northwest Wildlife Council – Robert D. Panther, Executive Director

Natural Resources Research Library – S.J. and Jessie E. Quinney

Northwest Trail Bikers Association – Norvel Arbogast

Oregon Wild – Tim Lillebo, Chandra LeGue, Doug Heinkin

Oregon Trout – Jim Myron

Pendleton Record

Rocky Mountain Elk Foundation – Rance Block

Sierra Club Oregon Chapter – Asante Riverwind, Ivan Maluski

Washington Wilderness Coalition – Tom Uniack

Wilderness Society – Cynthia Wilkerson

Wildlife Management Institute – Robert P. Davison, NW Field Rep

Individuals

James P. Bailey

Howard Bryant

Loren Clark

Steve Corey

David Davis

John Edmundson

David Hunt

Barbara Gilbert

Bret Harting

Richard Isaacson

Lyle Jensen

John M Leonard

J. V. Lundsten

Roger Neufeldt

Dave Price

Erik Ryberg

M Sharp

Don Stroeber

Ron Yockim

Interdisciplinary Team

The following Forest Service personnel served on the Interdisciplinary Team (IDT) that prepared this environmental assessment:

Core Interdisciplinary Team:

Janet Plocharsky	Team Leader
Michael Burns	Silviculture
Brian Spradlin	Fire, Fuels, Air Quality
Randy Scarlett	Wildlife
Kristy Groves	Fisheries

Interdisciplinary Team Consultants:

Tom Mafera	District Ranger
Craig Busskohl	Soils
Ed Farren	Water Quality
Allen Madril	Cultural and Historical Properties
Gary Popek	Geographic Information Services
Mike Pond	Economics
Dave Powell	Silviculture
Lori Seitz	Roads Analysis
Janel McCurdy	NEPA Consultant, Recreation, Undeveloped Areas
Brian Spivey	Harvest Systems
Scott Wryn	Fuels
Joan Frazee	Botany
Tim Collins	Range, Noxious Weeds

There are no de-facto or designated municipal watersheds in the Loon Analysis Area.

Clean Air Act

All prescribed burning operations associated with each action alternative would comply with the State of Oregon's Smoke Management Implementation Plan and would be implemented within guidelines of the Smoke Management Program. Fuel treatments can be timed to minimize the impacts of smoke on forest users and local communities. The removal and direct treatment of biomass would reduce emissions should a wildfire occur. The effect of smoke under any action alternative would be short term and restricted to dispersed campgrounds. Particulate matter is not expected to exceed standards in the communities of concern (Asotin, Elgin, Enterprise, and La Grande). See Air Quality analysis.

National Forest Management Act Compliance

The proposed harvest and prescribed fire activities and vegetation manipulation meet direction of CFR 36 219.27. Resource protection measures have been included in the project design and effects disclosed in the analysis. Soil productivity and water quality are being protected and management requirements minimize serious and long lasting hazards. The project as a whole is focused on prevention or reduction of serious, long lasting hazards and damage from pest organisms and wildfire through the use of silvicultural systems that maintain stand vigor and reduces fuel composition to increase successful suppression efforts. Proposed stand treatments utilize un-even aged management prescriptions. The implementation of PACFISH guidelines protects stream, streambank, and wetland habitats providing adequate fish habitat to maintain viable populations of fish.

All proposed harvest units are planned on suitable land and should any areas need re-forestation they would be capable of re-stocking within 5 years of harvest either by natural or artificial means. The action alternatives favor the development of stands dominated by seral tree species and low fuel levels such that fire successful suppression actions can be taken with an engine crew. The proposed action and alternatives accomplish multiple-use resource goals focused on protection of the Palmer Valley Wildland Urban Interface. Improvement and Commercial Thinning harvests are the primary harvest prescriptions; no regeneration harvest is proposed though small patch cuts for uneven-aged management do occur. Stand objectives are to improve forest health and increase stand resilience while reducing fuel loads. Stands would be managed to recommended stocking levels and at fuel levels characterized by Fuel Model 8. These objectives would reduce potential catastrophic loss from insects, disease, and wildfire and increase the ability to safely and successfully suppress wildfire while small in size.

The thinning occurs in stands which developed naturally at higher stocking levels. The competing species which increased in the understory would be thinned resulting in a greater proportion of early seral species, typically ponderosa pine and larch. This treatment will improve the stands vigor by reducing competetion between trees for water, nutrients and sunlight. Stands with higher vigor would help to keep insect populations at endemic levels. By favoring and/or planting more resistant species, the proliferation of dwarf mistletoe and root rots can be reduced.

Forest Plan Consistency

Table 3-28 Gross Acres of Harvest in Current Forest Plan Management Areas
C1 will become E2 and C3 would become C4

Alternative	A3	A5	C4	E2	Total
B	148	97	232	1,598	2,075

C	537	97	232	1,350	2,216
D	352	0	220	623	1195

All alternatives accomplish Forest Plan goals for resources as summarized in Chapter 1 and the analysis shows impacts to be consistent with Forest Plan Standards and Guidelines. The fuels focus of the action alternatives allows the Forest to execute a fire protection program that is responsive to land and resource management goals and objectives by providing areas where successful suppression actions can be taken to reduce the chance of a wildfire moving from the forest into communities at risk within the Palmer Valley WUI. Fuel management treatments have been guided by the protection and resource objectives of the management area along with considering the goals for the WUI and forest resource management objectives. Surface and aerial fuel treatments will utilize the market for wood products to accomplish most of the reduction objectives. When fuels are to be burned, air quality and smoke management objectives have been incorporated into the project to meet state air quality standards. Logging systems and harvest prescriptions have been designed to protect resource goals and objectives. Big Game cover and old forest habitat were considered when locating proposed harvest and fuel treatment units and developing prescriptions. Protection measures for water quality were included through Best Management Practices and minimizing direct input of sediment into streams. Where timber harvest has needed to remove danger trees in the Little Phillips Creek RHCA along Highway 204 and reduce fuels between the highway and the WUI, a forest plan amendment was included.

The project has been designed to conform to Forest Plan Amendment 10 for PACFISH. Management Requirements have been identified in Chapter 2 and Appendix E for Best Management Practices. Impacts to water quality and fisheries habitat has been disclosed in relation to meeting PACFISH guidelines.

The harvest activities meet the specifications of Forest Plan Amendment 11 (Eastside Screens). An HRV analysis was performed. Late Old Structure is below HRV so no green trees greater than 21 inches will be cut. The proposed thinning would shorten the time needed for trees to become old structure. Growth rates would increase to maintain vigor and resilience to fire, disease, and insects. Units 14, 15, and 20 would retain all standing dead larger than 21 inches that are not a safety concern.

The Umatilla Forest Plan (1990) established standards and guidelines for dead standing and downwood for various levels of biological potential in each management area. The plan was amended in 1995 by the Regional Forester as Umatilla Forest Plan Amendment #11, also known as the "Eastside Screens." Based on the amended direction, "new" snag requirements and replacement trees objectives were developed for the vegetative working groups on the Forest and documented in the memo, "*Interim Snag Guidance for Salvage Operation*" (Umatilla National Forest 1993). The 0.14/acre density for snags greater than 20 inches reflects the 100 % PPL for the Eastside Screen amendment.

The Decayed Wood Advisor (DecAid) by Mellen et al. (2003) is a source of information that provides guidance to land managers evaluating effects of forest conditions and existing or proposed management activities on organisms that use snags, downwood, and other wood decay elements. DecAid is a statistical summary of empirical data from published research on wildlife and deadwood. Data provided in DecAid allows the user to relate the abundance of deadwood habitat for both snags and logs to the frequency of occurrence of selected wildlife species that require dead wood habitat for some part of their life cycle. Tolerance levels provided in DecAid provide estimates of all individuals in the population that value a particular parameter (e.g., snag density, snag diameter, downwood density, etc. (Mellen et al. 2003). Tolerance levels are equivalent to the likelihood that individuals will use an area given a specified density. The lower the tolerance level, the fewer individuals will likely use the area. DecAid evaluations are best performed at the landscape, watershed, or larger scale. In DecAid, the 50% tolerance level for the pileated woodpeckers is 30.4 snags per acre greater than or equal to 10 inches in

diameter of which 7.3 snags per acre are greater than or equal to 20 inches in diameter. Tolerance levels are not the same as potential population levels. The tolerance levels for the pileated woodpecker display the potential (percent) for individuals to occur in an area having certain snag characteristics. Other factors such as amount of canopy cover, how close snags are to edge, tree species composition, amount of decay, amount of ground cover, and size of trees within the stand also affect the likelihood that species will use the area.

The analysis indicates that the projects would meet Forest Plan standards and guidelines for management indicator species. Monitoring of habitat, observations of species, and inventory efforts are occurring on the forest. This information may not show up in the Forest's monitoring reports but is typically documented in watershed assessments and individual project files. Monitoring for MIS is a broad scale analysis and not a site-specific analysis. Surveys are being done in some areas of the forest, but not specifically for this project.

Prime Farmland, Rangeland, and Forestland

No prime farmland, rangeland, or forestland occurs within the analysis area.

American Indian Treaty Rights

Because the government is bound to perform its trust duties in a manner that will not diminish, abridge, violate or abrogate reserved treaty rights or direction in executive orders, the Umatilla National Forest has endeavored to solicit the comments of the Nez Perce and the Confederated Tribes of the Umatilla Indian Reservation to determine what effects may occur to Tribal interests and treaty resources as a result of implementing the proposed alternatives in the planning area. The Confederated Tribes of the Umatilla Indian Reservation visited the planning area with the District Ranger and District Planning and Fire Staff in May of 2007. Items discussed included the Tribe's introduction of chinook salmon in Lookingglass Creek, the availability of huckleberry, and impacts to steelhead trout in Little Phillips Creek from the danger tree removal and reduction in canopy cover to reduce the risk of crown fire. How the action alternatives are responsive to the issues raised by the Tribe is discussed in Chapter 1. This section will recap potential impacts to exercising treaty rights. More detail can be found in the analysis for the resource earlier in this chapter.

Impacts to fisheries: Other than Little Phillips Creek and 3 miles of FR 63 where it is adjacent to Lookingglass and Little Lookingglass Creeks, the alternatives would not enter RHCAs because of PACFISH buffer protection. The haul on FR 63 has a low pontential for delivering sediment into the streams should wet weather haul occur at such times when water flows off the road into the stream. The haul occurs low in the the stream reach where it is a high gradient stream in a fish migratory section. Sediment delivery would be short duration and would disturb spawning or rearing fish. The activity would not effect viable populations or successful spawning in the upper reaches, distant from roads. Most of the stream miles are in inventoried roadless areas or undeveloped areas. PACFISH buffers would protect fisheries habitat.

In Little Phillips Creek Oregon State Highway is the major impact to fisheries habitat. The road shares the floodplain, channelizing the stream. Winter maintenance using sand and gravels is a source of sediment. Large wood is only permitted in the stream where it is not a hazard to traffic or would cause damage to the highway; long sections of the stream lack large wood. The danger tree cutting and removal would leave large wood in the stream where it is safe to do so. Trees would be planted to replace trees cut and the canoy has been reduced. The fish population in Little Phillips Creek is highly stressed and the low impacts from the danger tree removal and canopy reduction are a concern. Impacts

from sediment and the felling activity is expected to be small and short in duration. Design features are included that would further reduce potential impacts by having the activity occur when the stream contains enough water to allow the fish to move from the area or have the action occur when the stream section is dry. Danger tree cutting is the only vegetation treatment proposed in the perennial portion of the stream. Surface fuels would be hand piled and burned. Protection measures would limit the amount of fire that could reach the streams edge and areas of exposed soil revegetated. Impacts to fish is expected to be small and short duration. The action would occur during spawning season with the potential of fish moving away during the felling or damage to reds from felling large wood into the stream. The action is not expected to move the population to non-viable levels.

Viable populations of existing and desired wildlife species: The project has been designed to protect old forest and reduce impacts to big game habitat. No green trees larger than 21 inches in diamter would be cut. Uneven aged management would be used to reduce fuel and canopy with a focus on remval on small diamter trees.

Road and Access: The Access and Travel Management Plan was reviewed and no changes have been proposed nor would there be a reduction in miles of road.

Huckelberry: The stands proposed for treatment were reviewed for the ability to increase huckleberry production. Only units 4, 27, 28, and 33 have plant asociations that include huckleberry. These units are located in an area of important cover for big game and provided old forest habitat. These stands would not become open enough to increase huckleberry production.

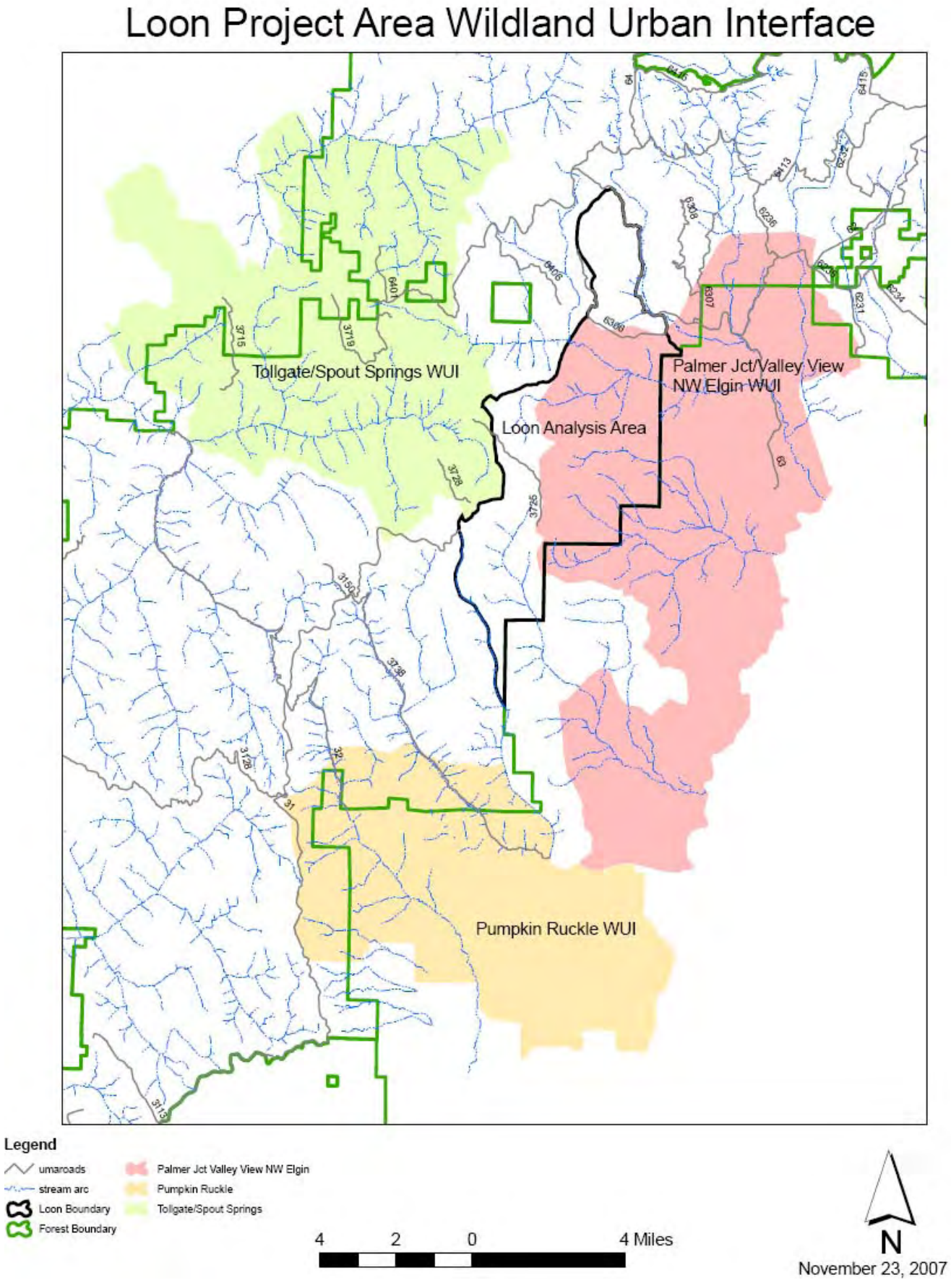
Consumers, Minority Groups, and Women

Alternatives B, C and D and improvement projects would be governed by a Forest Service contracts, which are awarded to qualified purchasers regardless of race, color, sex, religion, etc. This contract also contains nondiscrimination requirements. While timber harvest identified here creates jobs and provide consumer goods, no quantitative output, lack of output, or timing of output associated with these projects would affect the civil rights, privileges, or status quo of consumers, minority groups, and women.

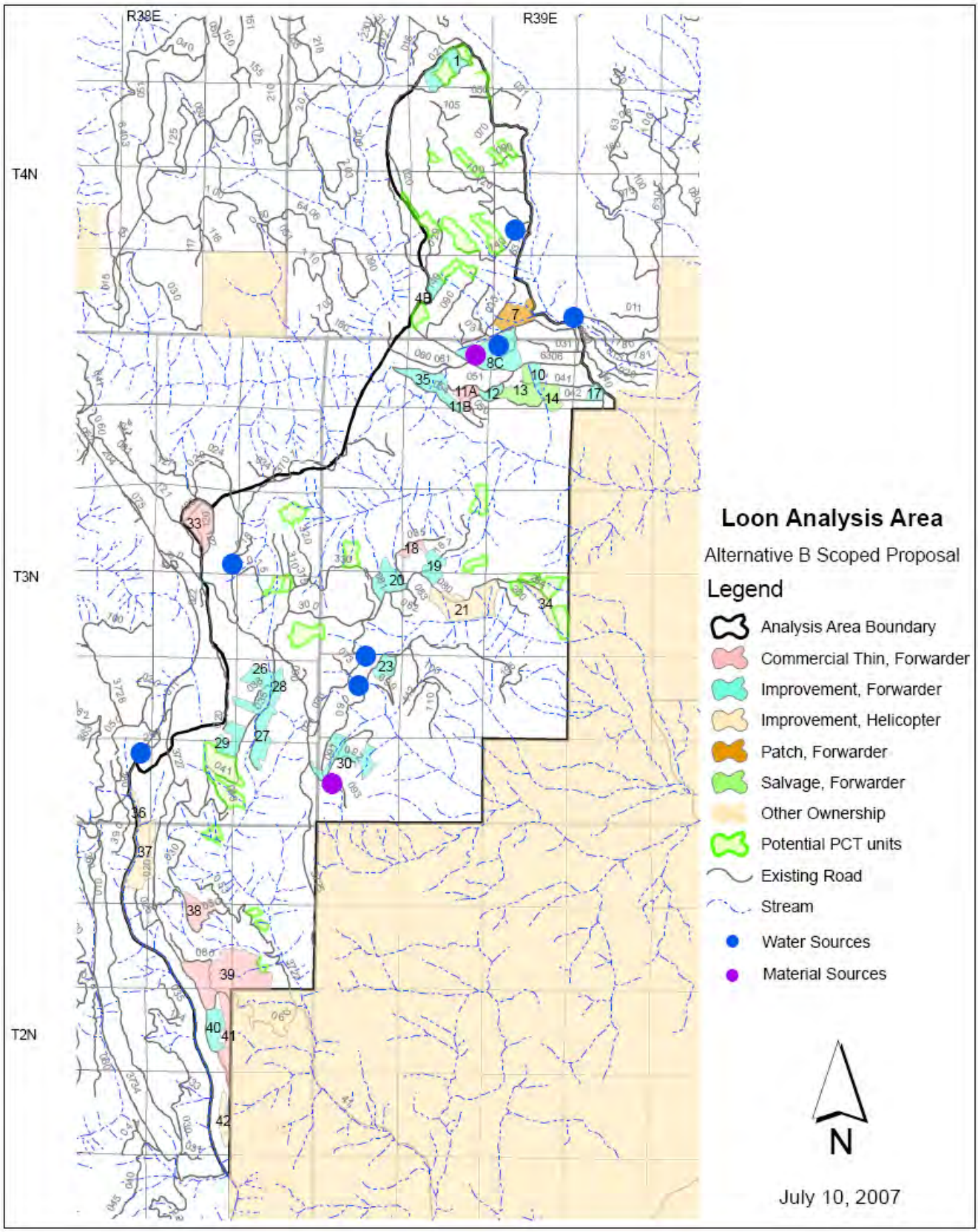
Environmental Justice

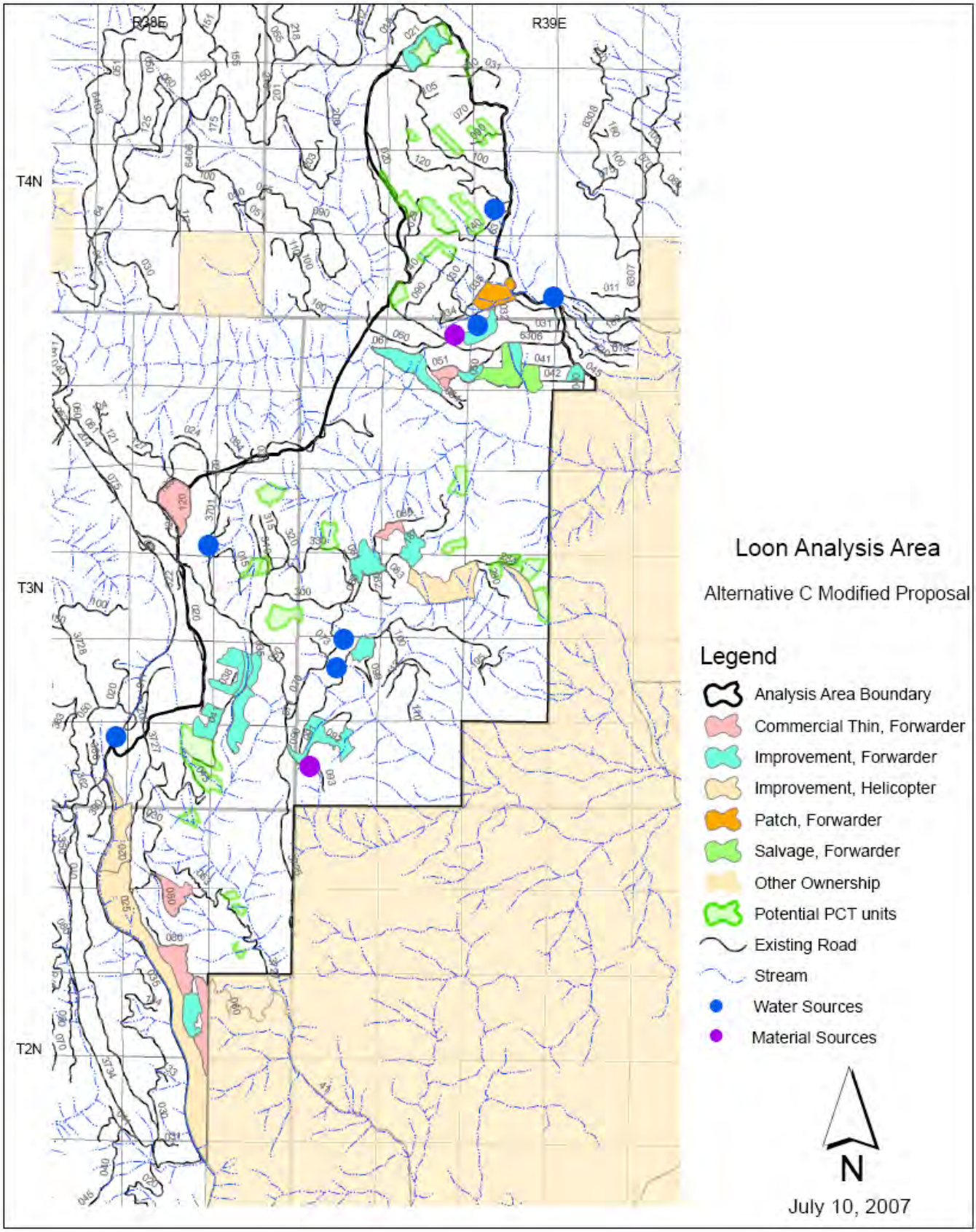
Executive Order 12898 requires that federal agencies adopt strategies to address environmental justice concerns within the context of agency operations. With implementation of any of these alternatives, there would be no disproportionately high and adverse human health or environmental effects on minority or low-income populations. Smoke management would keep particulate matter within standards. Past burning and wildfires did not show degradation below standards at EPA stations in La Grande, Oregon. The actions would occur in a remote area and nearby communities would mainly be affected by economic impacts related to timber harvest or contractors implementing rehabilitation activities. The proposed actions should have a positive affect on mushroom and cultural plants, which often consist of low income or minority groups. Racial and cultural minority groups could be prevalent in the work forces that implement harvest, prescribed fire, tree planting, herbicide application, thinning, or fish habitat improvement projects. Contracts contain clauses, which address worker safety, and additional measures regarding herbicide application have been detailed in mitigation measures from the Forest Noxious Weed EA.

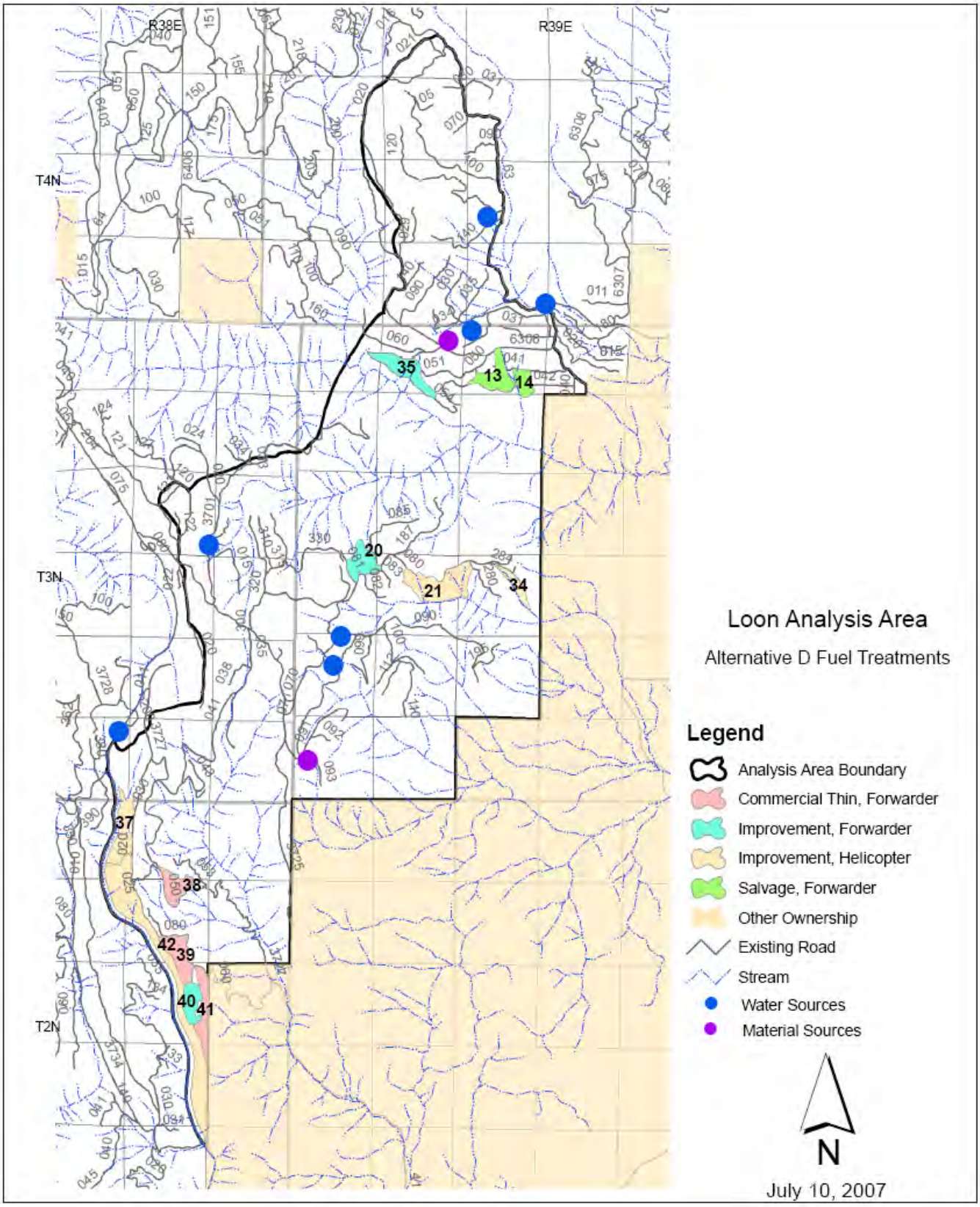
Appendix A


Loon Project Area Wildland Urban Interface
Tollgate/Spout Springs WUI
Palmer Jct/Valley View
NW Elgin WUI
Loon Analysis Area
Pumpkin Ruckle WUI
Legend
umaroads
stream arc
Loon Boundary
Forest Boundary
Palmer Jct Valley View NW Elgin
Pumpkin Ruckle
Tollgate/Spout Springs
4 2 0 4 Miles
N
November 23, 2007

Appendix B Alternative Maps




R38E
R39E
T4N
T3N
T2N
Loon Analysis Area
Alternative C Modified Proposal
Legend
Analysis Area Boundary
Commercial Thin, Forwarder
Improvement, Forwarder
Improvement, Helicopter
Patch, Forwarder
Salvage, Forwarder
Other Ownership
Potential PCT units
Existing Road
Stream
Water Sources
Material Sources
N
July 10, 2007


R38E
R39E
T4N
T3N
T2N
35
13
14
20
21
34
37
38
42
39
40
41
Loon Analysis Area
Alternative D Fuel Treatments
Legend
Analysis Area Boundary
Commercial Thin, Forwarder
Improvement, Forwarder
Improvement, Helicopter
Salvage, Forwarder
Other Ownership
Existing Road
Stream
Water Sources
Material Sources
N
July 10, 2007

Appendix C Current PACFISH Standards and Guidelines

TM-1 Prohibit timber harvest, including fuelwood cutting, in Riparian Habitat Conservation Areas, except as described below. Do not include Riparian Habitat Conservation Areas in the land base to determine the Allowable Sale Quantity, but any volume harvested can contribute to the timber sale program.

a. Where catastrophic events such as fire, flooding, volcanic, wind, or insect damage result in degraded riparian conditions, allow salvage and fuelwood cutting in Riparian Habitat Conservation Areas only where present and future woody debris needs are met, where cutting would not retard or prevent attainment of other Riparian Management Objectives, and where adverse effects on listed anadromous fish can be avoided. For watersheds with listed salmon or designated critical habitat, complete Watershed Analysis prior to salvage cutting in RHCAs.
b. Apply silvicultural practices for Riparian Habitat Conservation Areas to acquire desired vegetation characteristics where needed to attain Riparian Management Objectives. Apply silvicultural practices in a manner that does not retard attainment of Riparian Management Objectives and that avoids adverse effects on listed anadromous fish.

FM-1 Design fuel treatment and fire suppression strategies, practices, and actions so as not to prevent attainment of Riparian Management Objectives, and to minimize disturbance of riparian ground cover and vegetation. Strategies should recognize the role of fire in ecosystem function and identify those instances where fire suppression or fuel management actions could perpetuate or be damaging to long-term ecosystem function, listed anadromous fish, or designated critical habitat.

RA-2 Trees may be felled in Riparian Habitat Conservation Areas when they pose a safety risk. Keep felled trees on site when needed to meet woody debris objectives.

Appendix D

PACFISH Standards and Guidelines needing amending

Timber Management

TM-1 Prohibit timber harvest, including fuelwood cutting, in Riparian Habitat Conservation Areas, except as described below. Do not include Riparian Habitat Conservation Areas in the land base used to determine the Allowable Sale Quantity, but any volume harvested can contribute to the timber sale program.

a. Where catastrophic events such as fire, flooding, volcanic, wind, or insect damage result in degraded conditions, allow salvage and fuelwood cutting in Riparian Habitat Conservation Areas only where present and future woody debris needs are met, where cutting would not retard or prevent attainment of other Riparian Management Objectives, and where adverse effects on listed anadromous fish can be avoided. For watersheds with listed salmon or designated critical habitat, complete Watershed Analysis prior to salvage cutting in RHCAs.

b. Apply silvicultural practices for Riparian Habitat Conservation Areas to acquire desired vegetation characteristics where needed to attain Riparian Management Objectives. Apply silvicultural practices in a manner that does not retard attainment of Riparian Management Objectives and that avoids adverse effects on listed anadromous fish.

Fire/Fuels Management

FM-1 Design fuel treatment and fire suppression strategies, practices, and actions so as not to prevent attainment of Riparian Management Objectives, and to minimize disturbance of riparian ground cover and vegetation. Strategies should recognize the role of fire in ecosystem function and identify those instances where fire suppression or fuel management actions could perpetuate or be damaging to long-term ecosystem function, listed anadromous fish, or designated critical habitat.

General Riparian Area Management

RA-2 Trees may be felled in Riparian Habitat Conservation Areas when they pose a safety risk. Keep felled trees on site when needed to meet woody debris objectives.

Appendix E

MONITORING AND MITIGATION

BMP's and Contract "C" clauses will be included to insure minimal ground disturbance and to provide adequate mitigation (see Appendix A). Effectiveness/implementation monitoring will be performed by TMA/resource personnel (the presale technician will assure BMPs are met during sale preparation and the sale administrator will assure BMPs are met during timber sale operations). Forwarding- mechanical harvesting systems will be utilized to protect soils from excessive disturbance. Regional Standards require that C clause C6.6# be included to prevent adverse cumulative soil impacts (<15%) and protect soils. Logging slash and large wood should be left and scattered on forwarder trails, landings and throughout the harvested area to meet Forest Plan Guidelines.

Specific resource protection measures and mitigation's listed below would be implemented in any action alternative. These resource protection measures and mitigation's are consistent with the Umatilla National Forest LRMP standards and guidelines. The general discussion of Best Management Practices (BMP's) are found in the General Water Quality Best Management Practices, Pacific N.W. Region, 1988. BMP's and resource protection measures are identified below, as well as an estimation of the ability to implement BMPS's, their anticipated effectiveness, timing and responsibility for monitoring.

1. Maintain all Riparian Habitat Conservation Areas (RHCAs), with no removal of timber from these areas. PACFISH provides default standard widths for RHCAs based on one of four categories: fish bearing; perennial, non-fish bearing; ponds, lakes, wetlands greater than 1 acre; and intermittent or small wetlands. The following standard widths, applied to each side of the stream, define the RHCAs for this project:

Category 1 - **Fish-bearing streams**: RHCA's consist of the stream and the area on either side of the stream extending 300 feet slope distance from the edges of the active stream channel, regardless of Forest Type.

Category 2 - **Perennial non-fish-bearing streams**: RHCA's consist of the stream and the area on either side of the stream extending 150 feet slope distance from the edges of the active stream channel, regardless of Forest Type.

Category 3 - **Ponds, lakes, reservoirs, and wetlands greater than 1 acre**: RHCA's consist of the body of water or wetland and the area extending 150 feet slope distance from the edge of the maximum pool elevation of constructed ponds and reservoirs or from the edge of the wetland, pond or lake, regardless of Forest Type.

Category 4 - **Seasonally flowing or intermittent streams, wetlands less than 1 acre, landslides, and landslide-prone areas:** This category includes features with high variability in size and site-specific characteristics, and assumes listed stock. At a minimum the RHCA's must include: the area from the edges of the stream channel, wetland, landslide, or land-slide prone area to a distance equal to 120 feet.

2. Follow PACFISH standards and guidelines in RHCAs. Timber Management, Roads Management, and Fire/Fuels Management standards and guides apply to this project.

3. Design harvest systems to minimize crossing stream channels and ephemeral draws. All drainage crossings, including ephemeral draws, are to be approved on the ground by the Sale Administrator in consultation with the Hydrologist.

4. Ephemeral stream channels should have protections to minimize equipment disturbance of duff and soil, and should not be used as skid trails, landing sites, or as road locations. Ephemeral draws, not within RHCAs, are to meet the following down wood requirements to reduce risk of upward migration and channel initiation: retain all wood embedded in the soil; retain at least 5 pieces of wood >12" diameter and >20' in length per 1000' of draw bottom (average 1 piece per 200'); retain at least 20 pieces of wood >6" diameter and >10' in length per 1000' of draw bottom (average 1 piece per 50'). Ephemeral draws with a gradient of 5% or more will need to be visited by the hydrologist to determine if any additional site specific mitigation is required.

5. All temporary roads and landings shall be obliterated at the completion of their intended use (see BMP R-23) - NFMA requires that all temporary roads be returned to resource production within 10 years. Reclose all roads, with sufficient drainage structures, which are opened for project activities. For all temporary roads:

- · obliterate as soon as feasible after use
- · season of use shall be specified to minimize rutting, erosion, sedimentation, and water concentrations

· plan, locate, design, and construct temporary roads with ease of obliteration as a priority - stockpile topsoil and duff for re-shaping after use or obliteration
· horizontal and vertical alignments should conform to the natural contour as closely as possible - outsloped rolls in the grade effectively break up water concentrations during use and can be crafted into silt traps and planting pockets during obliteration

6. The following BMP's are identified for the timber sale portion of the project, along with an estimation of the ability to implement them, as well as their anticipated effectiveness, timing and responsibility for monitoring.

T-1 - Timber Sale Planning Process
Estimates will be made on the potential changes to water quality and instream beneficial uses.
Responsibility: Hydrologist and Fisheries Biologist
Timing: Prior to activity
Ability to Implement: High
Effectiveness: High

T-2 - Timber Harvest Unit Design
Unit design will ensure favorable conditions of water flow, water quality, and fish habitat through PACFISH RHCAs.
Responsibility: Hydrologist and Fisheries Biologist
Timing: Prior to activity
Ability to Implement: High
Effectiveness: High

T-4 - Use of Sale Area Maps for Designating Water Quality Protection Needs
The Sale Area Map will include locations of streams to be protected and the required harvest method (ephemeral draws would be protected during forwarder route design, but not under the protected stream course provision).
Responsibility: Presale Technician
Timing: Prior to activity
Ability to Implement: High
Effectiveness: High

T-8 - Streamcourse Protection (Implementation and Enforcement)
Location, method and timing of streamcourse crossing will be agreed upon in advance by the Forest Service and Purchaser.
Responsibility: Sale Administrator
Timing: During activity
Ability to Implement: High
Effectiveness: High

T-10 - Log Landing Location
Harvest plans will include proposed landing locations. Landing locations and size will be approved by the Forest Service in advance.
Responsibility: Presale Technician and Sale Administrator
Timing: Prior to and during activity
Ability to Implement: High
Effectiveness: High

T-11 – Yarding and Skidding Trail Location and Design
Harvest plans will include proposed yarding patterns. Trails will be approved in advance by Forest Service personel.
Responsibility: Presale Technician and Sale Administrator
Timing: Prior to and during activity
Ability to Implement: High
Effectiveness: High

T-12 - Suspended Log Yarding in Timber Harvesting
Full suspension will occur where forwarder and helicopter logging is required and partial suspension will occur where skyline logging is required so as to create minimal soil disturbance.
Responsibility: Presale Technician and Sale Administrator
Timing: Prior to and during activity

Ability to Implement: High
Effectiveness: High

T-13 - Erosion Prevention Measures During Timber Sale Operations
Equipment shall not operate when ground conditions are susceptible to detrimental soil disturbances (not more than 15% of the logged area is permitted to have detrimental soil disturbance). Erosion control work will be kept current.
Responsibility: Sale Administrator
Timing: During activity
Ability to Implement: High
Effectiveness: High

T-15 - Log Landing Erosion Prevention and Control
The Forest Service will designate areas for landing scarification and erosion control seeding as well as any necessary water bars or other drainage structures.
Responsibility: Sale Administrator
Timing: During activity
Ability to Implement: High
Effectiveness: High

T-18 - Erosion Control Structure Maintenance
The Purchaser will provide maintenance of soil erosion control structures as required in the TSC.
Responsibility: Sale Administrator
Timing: During activity
Ability to Implement: Moderate
Effectiveness: High

T-19 - Acceptance of Timber Sale Erosion Control Measures Before Sale Closure
The effectiveness of erosion control measures will be evaluated periodically during the life of the TSC.
Responsibility: Sale Administrator and Hydrologist
Timing: During activity
Ability to Implement: High
Effectiveness: High

T-20 - Reforestation
Suitable land will be reforested within five years of harvest.
Responsibility: Reforestation Technician
Timing: Prior to activity
Ability to Implement: High
Effectiveness: High

T-21 - Servicing and Refueling of Equipment
The Forest Service will designate refueling and servicing areas. A Spill Prevention Control and Countermeasures Plan is required if on site fuel storage exceeds 660 gallons in a single container or if total storage exceeds 1320 gallons.
Responsibility: Sale Administrator
Timing: During activity
Ability to Implement: High
Effectiveness: High

R-1 - General Guidelines for the Location and Design of Roads
Road reconstruction will assure design creates minimal resource damage.
Responsibility: Engineering Technician
Timing: Prior to activity
Ability to Implement: High
Effectiveness: High

R-2 - Erosion Control Plan
Limit erosion and sedimentation through effective planning and contract administration.
Responsibility: Engineering Technician
Timing: Prior to and during activity

Ability to Implement: High
Effectiveness: Moderate

R-3 - Timing of Construction Activities
Road reconstruction will occur during minimal runoff periods to minimize erosion.
Responsibility: Engineering Technician
Timing: During activity
Ability to Implement: High
Effectiveness: Moderate

R-18 - Maintenance of Roads
Ditches and culverts will be kept open and ruts repaired.
Responsibility: Sale Administrator
Timing: During activity
Ability to Implement: High
Effectiveness: High

R-20 - Traffic Control During Wet Periods
Haul and other associated traffic will be controlled when road damage is likely to occur due to road/weather conditions.
Responsibility: Sale Administrator
Timing: During activity
Ability to Implement: High
Effectiveness: High

R-21 - Snow Removal Controls to Avoid Resource Damage
Snow removal will assure water can drain from road prism before it develops enough energy to erode road surface or fill slopes.
Responsibility: Sale Administrator
Timing: During activity
Ability to Implement: High
Effectiveness: High

R-22 - Restoration of Borrow Pits and Quarries
Borrow Pits will be stabilized such that banks are stable and access road provides necessary drainage.
Responsibility: Engineering Technician
Timing: During activity
Ability to Implement: High
Effectiveness: High

R-23 - Obliteration of temporary roads and landings
Temporary roads and landings will be obliterated at the completion of their intended use to reduce chronic sediment sources and restore productivity. *Effective obliteration is generally achieved through a combination of the following measures: temporary culverts and bridges removed and natural drainage configuration reestablished, road* surface ripped, sideslopes reshaped and stabilized, road effectively drained and blocked, road returned to resource production through revegetation (grass, browse, or trees).
Responsibility: Sale Administrator, with advice from hydrologist
Timing: At the completion of activity
Ability to Implement: High
Effectiveness: High

F-1 - Fire and Fuel Management Activies
Activity related fuel will be managed to assure the risk of wildfire is not increased. The timber sale contract will be utilized to ensure that LRMP standards and guidelines for down woody material are met without necessitating additional impacts due to use of machinery. Some slash should be retained on the forwarder trails to reduce the chances of erosion, to trap sediment, and to provide nutrients to the soils for productivity.
Responsibility: Fire Management Officer
Timing: During activity
Ability to Implement: High
Effectiveness: High

F-2 - Consideration of Water Quality in Formulating Prescribed Fire Prescriptions
The prescribed fire plan will be developed to assure fire mortality does not exceed 10% of the tree canopy or remove effective ground cover from more than 20% of the burn area. Fire ignitions will not occur within RHCAs.

Responsibility: Fire Management Officer
Timing: Prior to activity
Ability to Implement: High
Effectiveness: High

F-3 - Protection of Water Quality During Prescribed Fire Operations
The prescribed fire will follow the burn plan. Adjustments will be made during firing operations if objectives are not being met.

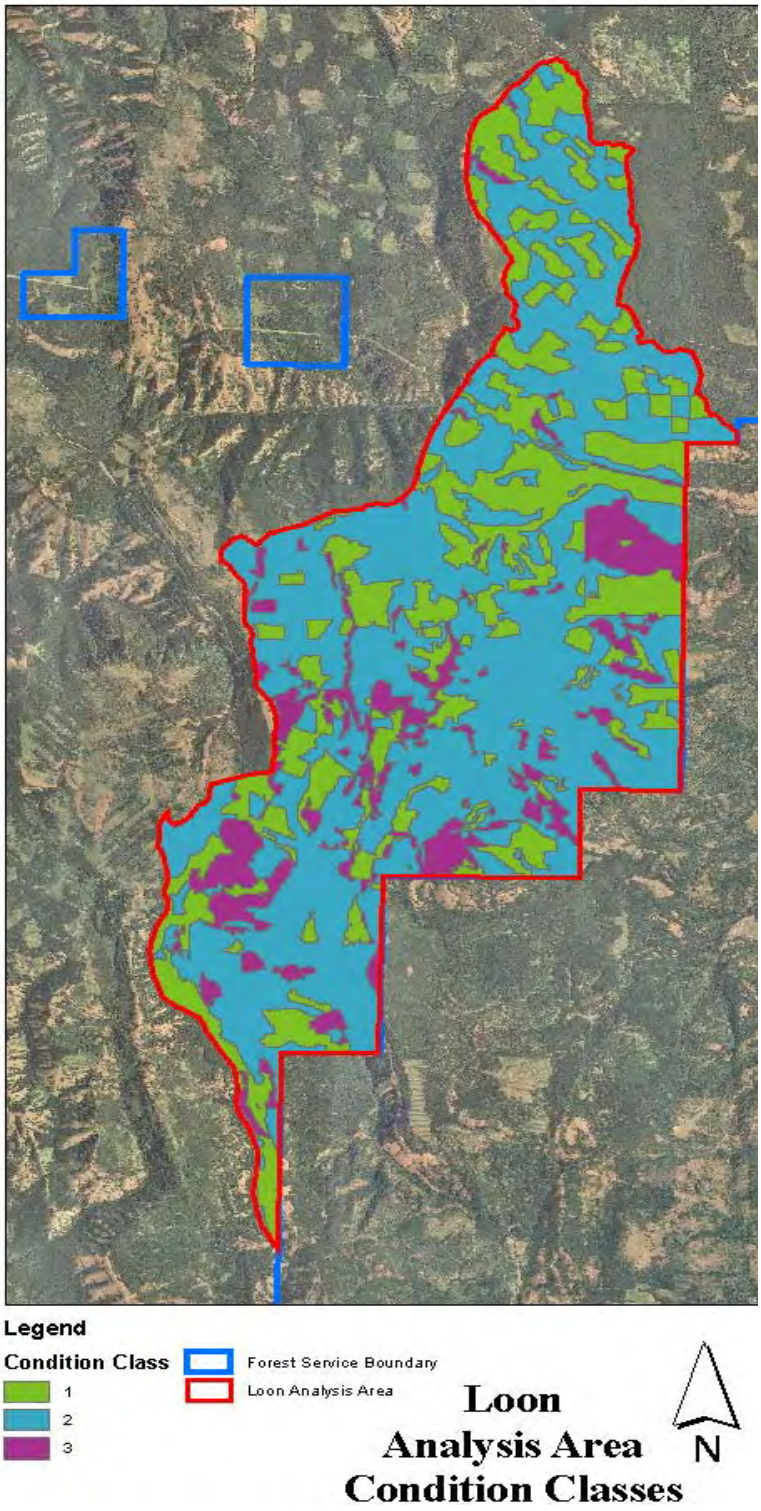
Responsibility: Fire Management Officer
Timing: Prior to and during activity
Ability to Implement: High
Effectiveness: High

W-5 - Cumulative Watershed Effects
To ensure that the additional effects of the proposed management activities, when added to the existing conditions, do not exceed thresholds of concern or result in adverse (degraded) water quality or channel/fish habitat conditions.

Responsibility: Hydrologist
Timing: Prior to activity
Ability to Implement: High
Effectiveness: High

Appendix F

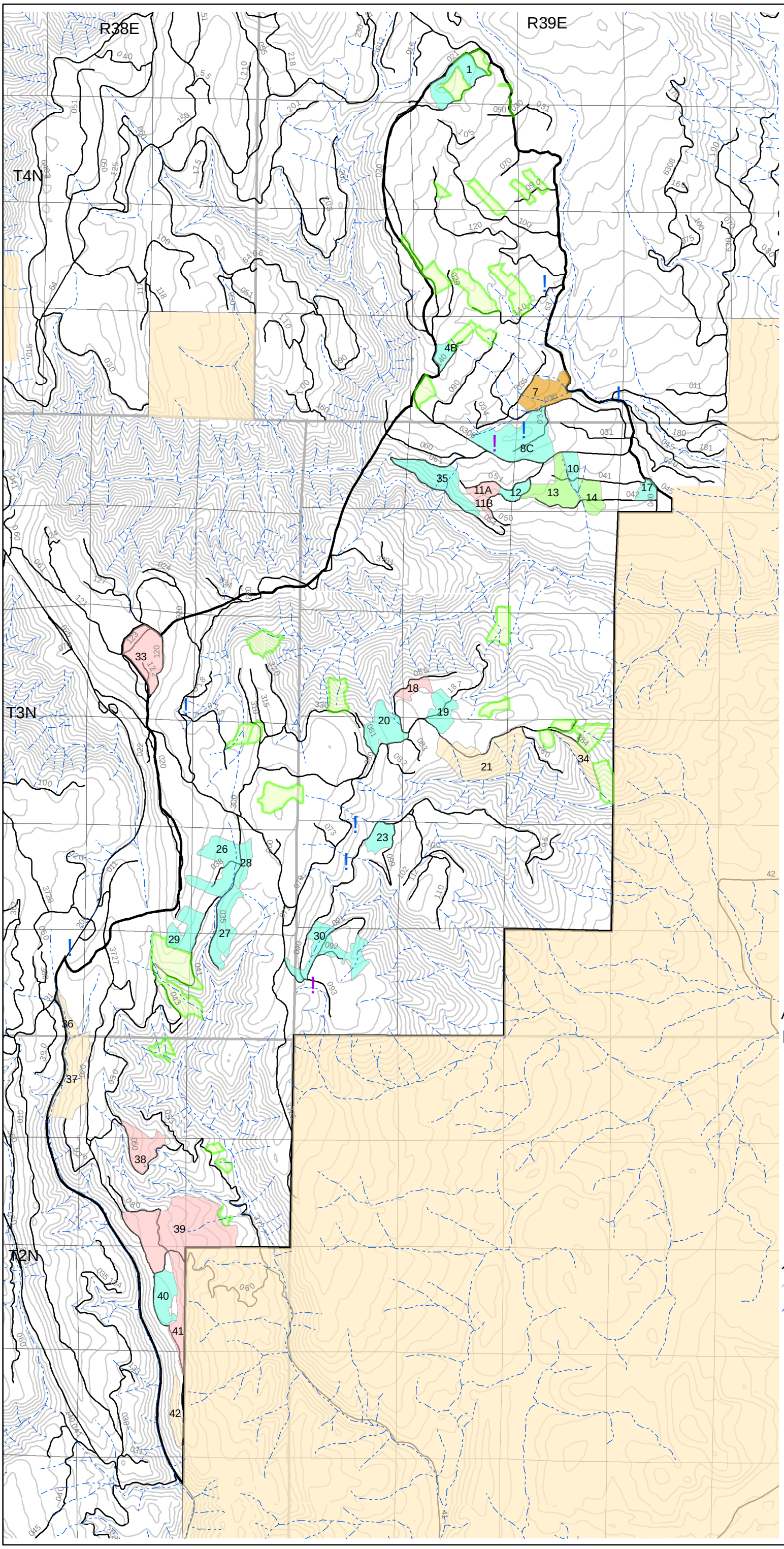
Condition Class of the Loon Planning Area



Appendix G Unit Information

unit	Silv RX	Structural Stage	Forest Plan Management Area	Fire Regime	Fuel Model	Condition Class	Alt B	Alt C	Alt D
1	Improvement	YFMS	E2	III	2	1	X	X	
4B	Improvement	OFMS	E2	III	2	1	X		
7	Patch	SEOC	C5/E2	III	8	1	X	X	
8C	Improvement	SEOC	E2	III	2	1	X	47 acres	
10	Improvement	SEOC	E2	III	2	1	X	X	
11A	Commercial Thin	SE/UR	E2	III	2	1	X	X	
11B	Commercial Thin	UR	E2	III	2	1	X	X	
12	Improvement	SEOC	E2	III	2	1	X	X	
13	Salvage	SEOC	E2	III	8	1	X	X	X
14	Salvage	SEOC	E2	III	10	3	X	X	X
17	Improvement	SECC	E2	III	2	1	X	X	
18	Commercial Thin	SECC	E2	I	8	1	X	X	
19	Improvment	SEOC	E2	III	2	1	X	X	
20	Improvement	SEOC/UR	E2	III	2	1	X	X	X
21	Improvement	UR	C4-110 C5-3 E2-46	III	2	1	X	X	X
23	Improvement	SEOC	E2	III	2	1	X	X	
26	Improvement	SEOC	E2	V	2	1	X	X	
27	Improvement	SEOC	E2	III	2	1	X	X	
28	Improvement	SEOC	E2	III	2	1	X	X	
29	Improvement	SEOC	E2	III	2	1	X	X	
30	Improvement	SEOC	C4-12 E2 - 84	III	8	1	X	X	
33	Commercial Thin	SEOC	A5	III	8	1	X	X	
34	Improvement	SECC	C4	III	8	1	X	X	X
35	Improvement	SEOC	C4-71 E2-18	III	9	1	X	X	X
36	Improvement	UR	A3	V	2	1	X	X	
37	Improvement	UR	A3-80 E2-40	III	2	1	X	X	97 acres
38	Commercial Thin	SEOC	E2	I	8	2	X	X	X
39	Commercial Thin	SEOC	E2	III	2, 8	1	X	82 acres	82 acres

unit	Silv RX	Structural Stage	Forest Plan Management Area	Fire Regime	Fuel Model	Condition Class	Alt B	Alt C	Alt D
40	Improvement Commercial	SECC	A3-5 E2-52	I	8	2	X	X	X
41	Thin	SEOC	A3-6 E2-63	I	8	2	X	X	X
42	Improvement	SEOC		I	9	3	A3	489 A3-424 E2-65	350 A3-285 E2-65



Loon Analysis Area

Alternative B Scoped Proposal

Legend

- Analysis Area Boundary
- Commercial Thin, Forwarder
- Improvement, Forwarder
- Improvement, Helicopter
- Patch, Forwarder
- Salvage, Forwarder
- Other Ownership
- Potential PCT units
- Existing Road
- 100' Contours
- Stream
- ! Water Sources
- ! Material Sources

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R38E
R39E
T4N
T3N
T2N

Loon Analysis Area

Alternative C Modified Proposal

Legend

- Analysis Area Boundary
- Commercial Thin, Forwarder
- Improvement, Forwarder
- Improvement, Helicopter
- Patch, Forwarder
- Salvage, Forwarder
- Other Ownership
- Potential PCT units
- Existing Road
- Stream
- 100' Contour
- ! Water Sources
- ! Material Sources

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R38E

R39E

T4N

T3N

T2N

35

13

14

20

21

34

37

38

39

40

41

42

Loon Analysis Area

Alternative D Fuel Treatments

Legend

- Stream
- Analysis Area Boundary
- Other Ownership
- Commercial Thin, Forwarder
- Improvement, Forwarder
- Improvement, Helicopter
- Salvage, Forwarder
- Existing Road
- 100' Contour
- ! Water Sources
- ! Material Sources

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