United States
Department of
Agriculture

Forest Service

Malheur National
Forest
Blue Mountain
Ranger District

Dads Creek WUI Fuels Reduction Project

Environmental Assessment

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CHAPTER 1 – PURPOSE AND NEED

Introduction

The Dads Creek Wildland Urban Interface Project is designed to reduce hazardous fuels in a portion of the Wildland Urban Interface (WUI) that was designated by the Grant County Community Fire Protection Plan.

The project area encompasses approximately 7,200 acres 7 miles northeast of Prairie City, Oregon on the Blue Mountain and Prairie City Ranger Districts of the Malheur National Forest (see the Vicinity Map located before the Table of Contents and Map 1 in Appendix B).

Fire suppression, vegetation growth, partial overstory removal harvests, and insect and disease mortality has resulted in an accumulation of fuels and unacceptable fire hazard to private and public lands. This project proposes to reduce these fuels by a combination of thinning, timber harvesting, slash removal treatments, and prescribed burning. This document is the result of local collaboration, public participation, and interdisciplinary design. Project design measures provide for protection of cultural or historical sites, soil, water, fish, wildlife, range, native plants and trees, scenery, and recreation.

This Environmental Assessment (EA) is being prepared under guidelines contained in the Healthy Forests Restoration Act (HFRA). The HFRA directs Federal agencies to prepare EA's utilizing the collaborative process to implement local community fire protection plans.

Relationship to the Forest Plan

This EA tiers to the Malheur National Forest Land and Resource Management Plan Final Environmental Impact Statement and Record of Decision (1990) and incorporates by reference the accompanying Land and Resource Management Plan (LRMP, also called the Forest Plan)(1990), as amended. Amendments include, but are not limited to, the Regional Forester's Forest Plan Amendment No. 2 (USDA 1995a) and the Interim Strategies for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California (PACFISH, USDA 1995b). The project identified in this EA is being proposed to meet appropriate Forest-wide goals and standards (pages IV-1 to IV-45) and to comply with Management Area goals and standards (pages IV-46 to IV-139) of the Forest Plan.

Healthy Forests Restoration Act (HFRA)

The Healthy Forests Restoration Act of 2003 (HFRA) was signed into law on December 3, 2003. The purpose of the Healthy Forest Restoration Act is to improve the capacity on Federal lands to plan and conduct hazardous fuels reduction projects aimed at protecting communities, watersheds, and certain other at-risk lands from catastrophic wildfire, to enhance efforts to protect watersheds and address threats to forest and rangeland health, including catastrophic wildfire, across the landscape. The Dads Creek WUI Fuels Reduction Project qualifies under *Title 1 - Hazardous Fuel Reduction on Federal Land* of the HFRA. The project is an Authorized Hazardous Fuels Reduction Project as described in Section 102 of the HFRA because it is consistent with the *Implementation Plan for the 10-Year Comprehensive Strategy* and is on Federal lands within a wildland urban interface area identified in a community wildfire protection plan.

HFRA-authorized fuel projects must be designed to retain or culture old-growth forest structure and large trees according to provisions in the law (explained in more detail in the “Desired Conditions” section). Additionally, authorized projects must be conducted consistent with all current laws or policies governing forest management in the area, as outlined in the preceding section.

To expedite authorized projects, HFRA requires collaborative planning. It also contains provisions that streamline the environmental review of a project. These provisions include: limits on appropriate alternatives that may be considered; and internal, administrative review of any objections to a project before a decision is made to approve it or carry it out (as opposed to post-decision appeals).

Grant County Community Fire Protection Plan

The Grant County Community Fire Protection Plan was developed by County citizens, fire districts, county staff or elected officials, State Forestry officials, and agency representatives. The Grant County Community Fire Protection Plan’s objective is to reduce the risk of forest fire to life, property, and natural resources in the County. The Grant County Court, Fire Defense Board, and Oregon Department of Forestry approved the plan in June and July of 2005 and they have updated it in 2007.

The Grant County Community Fire Protection Plan Wildland Urban Interface (WUI) boundary is based on the actual distribution of structures and communities adjacent to or intermixed with national forest lands. This project is within the Plan’s defined WUI boundary and is displayed on the Vicinity Map. The Dads Creek WUI project is included in the Grant County Community Fire Protection Plan Action Plan. It is a high priority of the Grant County Court to reduce the fire hazard in this area. The management objectives as stated in the Plan, are to provide a safe and effective area for fire suppression activities as well as enhance fire suppression capabilities by modifying potential fire behavior inside the urban forest intermix zone.

In cooperation with the Oregon Department of Forestry a number of private landowners in the Dads Creek area have already initiated projects on their lands to reduce fuels and overstocked stands.

Location and Setting

The proposed project is located in Grant County, Oregon, approximately 7 miles northeast of Prairie City. See the Vicinity Map for the location and extent of the project area. The legal description is:

T.11S. R.34E. Sections 33

T.12S. R.34E. Sections 3-5, 7-10, 14-17, 22-26, 35, 36

T.12S. R.35E. Sections 1, 2

T.13S. R.34E. Sections 30, 31

The project area is in the Dads Creek, Jeff Davis Creek, and Dan's Creek drainages which are tributary to the John Day River system. The project area encompasses all of the NF System lands within the Dads Creek subwatershed (approx. 7,100 acres), plus approximately 115 acres of the Dixie Meadows subwatershed (out of 20,116 acres) and less than an acre of the Isham Creek subwatershed (out of 21,610 acres). The portions of the project area that lie within the Dixie Meadows and Isham Creek subwatersheds are included in this project due to topography and access considerations that make inclusion in this project logical. The Dixie Wildlife Emphasis Area, an Inventoried Roadless Area, lies to the north and west of the project area. There are no treatments proposed in the roadless area.

The project area is known for frequent lightning strikes and roadless areas on the forest have burned in recent years and spread into general forest areas and surrounding private lands. Every year there are several small wildfires in the area ignited by lightning that are usually rapidly suppressed. Nearby fires in recent history that have escaped initial attack are the 11,000 acre Wildcat Fire in 1996, the 30,000 acre Summit Fire in 1996, and the 6,000 acre Easy Fire in 2002.

Purpose and Need for Action

Purpose

This project is being proposed to protect lives and property within the rural/urban community interface adjacent to National Forest lands.

Need

To provide protection there is a need to remove hazardous fuels from the area and manage forest vegetation to reduce the risk of uncharacteristic, severe fire moving from the Forest into private property. Decades of management that has included harvest of fire resistant large ponderosa pine and suppression of natural fires has resulted in forest conditions that are unlike historic conditions. Trees are crowded close together, small trees provide fuel ladders into the crowns of larger trees, and woody debris has built up on the forest floor. Unhealthy forest conditions are manifested in numerous bark beetle caused pockets of tree mortality, extensive defoliations by insects in recent decades, and elevated levels of dwarf mistletoe in both Douglas-fir and ponderosa pine.

Extensive local level collaboration was conducted consistent with the Implementation Plan during development of the Proposed Action. Private landowners have already begun the process of treating their adjacent lands to reduce the fire danger and improve forest health in cooperation with the Oregon Department of Forestry. Because of the close proximity of different land ownerships it is important that all parties act together to reduce the fire hazard to homes in the Dads Creek WUI. This project is designed to complement the treatments that have already been completed and to encourage future projects on private lands.

The vegetation treatments proposed are designed to increase the forest health and reduce the fire hazard (including surface fuels, ladder fuels, and crown fuels) within the wildland and urban interface. Treatments are designed to reduce the chance of surface fire becoming a crown fire and a small fire becoming an uncharacteristic severe wildfire. A mix of commercial cutting treatments to primarily treat crown fuels, precommercial thinning to treat ladder fuels, and piling and burning and/or underburning to treat surface fuels are recommended on a site specific basis depending on the current conditions, the biophysical environment, and location.

Existing Condition

The current vegetative conditions are a combined result of management practices, the most important being fire suppression and selective logging. The composition, structure, and functioning of the forest vegetation has changed over the last century.

Private lands within the planning area contain a mix of residential homes, outbuildings, and forestlands. Some of the forestlands serve as wooded reserves and parks near homes; other forestlands are managed for commercial timber products. All have value for the landowners and many of them have taken steps to improve the health and reduce the fire hazard of their holdings by thinning crowded stands and reducing ground fuels. They have expressed concern that the National Forest lands also be similarly managed near their lands to increase public health and safety.

On the National Forest lands, both the tree density and the proportion of fire intolerant fir species have increased from historical conditions. The lack of periodic fire and harvesting of large ponderosa pine has resulted in denser, younger, often multi-layered stands of trees that are composed of more fir trees and fewer pines and larches than historically occurred. Surface fuels have increased and are more continuous at these increased loadings across the landscape than were historical conditions. Increased surface fuel loadings increases the potential flame length of a fire thereby increasing the chance of a surface fire moving into the crowns. The smaller understory trees and the lower branches of larger fir trees to provide "ladder fuels", further enabling wildfire to move into the tree crowns and increasing the probability for an active crown fire.

Surface Fuels

The surface fuel loading is approximately:

Table 1-1 Surface Fuel Loading

	Light	Moderate	Heavy
Current	72%	18%	10%
In 20 Years Without Treatment	38%	21%	41%

Litter and duff accumulations are higher than those which historically accumulated. The fuel loading is not consistent with the forest types and fuel loads of Fire Regime 1, the frequently occurring surface fires that historically maintained low fuel loadings.

Ladder and Crown Fuels

The tree canopy is multi-layered and interlocking in many areas, which is not characteristic of historic conditions in the hot dry and warm dry forests. Canopy base height, canopy bulk density, and canopy continuity are key characteristics of forest structure that affect the initiation and sustainability of crown fire. Crown fires are generally considered the primary threat to ecological and human values. Canopy base height is currently low, with many trees providing fuel ladders into the upper crowns. In an uncontrolled fire situation, crown torching would be frequent in many areas. Crown bulk density, the weight of tree crowns over an area, is currently moderate to high. These conditions could result in fire that is difficult to suppress, and which would pose the greatest threat to life and property.

Expected Fire Behavior

Wildfire would burn as a stand replacing crown fire, with high rates of spread and severity to the vegetation and the soils. The dense stands of trees provide a continuous path for crown fire to spread across long distances. Fires would have long spotting distances and would show high resistance to control. The potential danger to fire fighters would necessitate using indirect methods that would increase the area burned and restrict the ability to safely protect private property, major access routes, and public safety. In most of the project area, natural fire occurrence under these conditions cannot be managed for resource benefit.

Desired Condition

Both private and publics forestlands are in a healthy condition that cumulatively present a low fire hazard to the mixed land ownerships.

- Minimize risks of catastrophic wildfire and restore fire as a disturbance process.
- Restore stand structure to resemble historical range of variability.
- Minimize conditions that promote uncharacteristically severe insect and disease outbreaks.

Most of the forest stands would have a high proportion of ponderosa pine with lesser amounts of Douglas-fir. Grand fir and western larch would exist on the steeper north faces and be at lower levels elsewhere. Stands would be healthy with low levels of insects and disease such as bark beetles, defoliating insects, and dwarf mistletoe. There would be more single stratum stands and more stands with large trees. These conditions would be characteristic of stands in Fire Regime 1, a low severity, high frequency fire regime. Forested stands are in a condition that allows prescribed and natural fire to be used to maintain condition class 1 or 2 without the need for costly mechanical fuel treatments. Condition class is a classification indicating how much change there has been to vegetation and fuels compared to the historical or reference conditions characteristic of the natural fire regime.

Surface Fuels

The desired fuel loading consistent with the hot dry and warm dry forest types in Fire Regime 1, is approximately 5 to 15 tons per acre, with half or more of this fuel loading being in the 3”+dbh size class of fuels depending on where the area is in the natural fire cycle. Duff accumulations would be relatively low and allow low intensity, high frequency fires to burn without damage to larger trees.

Ladder and Crown Fuels

Canopy base height would be maintained at sufficient height from frequent low-intensity fires that only occasional torching would occur. Crown bulk density, the weight of tree crowns over an area, would be sufficiently low that even if surface flame lengths were high enough to reach the crown, fire would not spread in a stand replacing type of crown fire. The canopy would be open, more characteristic of historic densities in the hot dry and warm dry forests.

Expected Fire Behavior

Fire intensity would be dependant on the fine fuels, grasses, pine needles and small down wood and would vary across the landscape. Fire would remain primarily as a surface fire, with high rates of spread but exhibiting low severity to the larger fire dependent trees and the soils. Fires would have short spotting distances, and would show much less resistance to control compared to a crown fire. Fire could be managed for resource benefit, if desired and appropriate.

Proposed Action Overview

The Blue Mountain and Prairie City Ranger Districts of the Malheur National Forest are proposing fuel reduction treatments on approximately 3,890 acres of National Forest System Land in response to the purpose and need for action. Actions included in this proposal are:

- 2,668 acres of mechanical treatment (cutting of trees) and fuel treatment
  - Commercial Thinning – 1421 acres
  - Understory Removal (Thinning from below in multi-story stands) – 362 acres
  - Convert to early seral species – 28 acres
  - Precommercial Thinning to 9" dbh – 799 acres
  - Precommercial Thinning in Commercial Thinning units – 666
  - Non commercial Thinning in Designated Old Growth Areas – 58 acres
- 2,532 acres of prescribed burning (1,467 acres of overlap with the above mechanical treatments)
- 1.8 miles of temporary road construction
- 1.4 miles of new road closures
- 44 miles of road maintenance for logging/biomass product haul
- A non-significant Forest Plan amendment that changes two standards:
  - Reduce Satisfactory Cover in winter range below Forest Plan Standards
  - Shift the Dedicated Old Growth Area (DOG) away from the Forest Boundary and create a new Replacement Old Growth Area(ROG)

Chapter 2 contains a complete description of the Proposed Action, specific design elements, monitoring requirements, and the non-significant Forest plan amendment that are proposed to implement this project.

This Proposed Action was developed by Forest Service personnel in collaboration with Blue Mountain Forest Partners and interested individuals and groups. The proposal presented here is the final result of the 12 month collaboration process (see pages 9-11 for more information about the collaboration process). All figures are approximate. Note that there may be minor variations throughout this document due to rounding and differences in methodology used to generate maps and tables.

Management Direction and Guidance

Forest Plan Management Areas

The Forest Plan uses management areas to guide management of the lands within the Malheur National Forest. Each management area provides for a unique combination of activities, practices and uses. The goals and objectives and desired condition for each management area are summarized below, and their locations are shown in Map 2 in Appendix B. The Forest Plan (Chapter IV) contains a detailed description of each management area. The acres shown are approximate and some management areas overlap, so the total exceeds the project area.

Land Allocations and Forest Plan Goals

General Forest-MA 1 and Rangeland-MA 2 (1090 acres) Emphasize timber and forage production on a sustained yield basis while providing for other resources and values.

Anadromous Riparian Areas-MA3B/RHCA- (720 acres) Manage riparian areas to protect and enhance their value for wildlife, anadromous fish habitat, and water quality.

Big Game Winter Range-MA4A (1700 acres) Maintain or enhance the quality of the winter range habitat for deer and elk through timber harvesting, prescribed burning, and other management practices. Manage for elk habitat by balancing cover quality and spacing, forage, and open road densities.

Old Growth Habitat-MA 13 (250 acres) Provide suitable habitat for old growth dependent wildlife species, ecosystem diversity, and preservation of aesthetic qualities. Dedicated Old Growth (DOG) areas are to be managed to provide old growth characteristics for old growth dependent species. Replacement Old Growth (ROG) areas are to be managed to provide future old growth habitat. Fuels are to be managed to maintain or enhance old-growth habitat, and to protect old-growth from “catastrophic” wildfire.

Visual Corridor Foreground-MA 14F (470 acres) and Visual Corridor Middleground-MA 14M (2750 acres) Manage corridor view-sheds with primary consideration given to their scenic quality and the growth of large diameter trees. The Highway 26 corridor is a sensitivity level 1 visual corridor. Forest Plan Correction #1 allows commercial thinning in visual corridors without a corridor management plan.

Dixie Wildlife Emphasis Area – MA 21 (220 acres) Manage to provide high quality fish and wildlife habitat and water quality. Timber harvest only to meet a wildlife or fish habitat objective. Objective is to manage in an unroaded condition. No treatments are planned in MA 21.

Forest Plan Amendments

Additional management direction is provided by Forest Plan amendments approved since 1990, some of which include:

- Regional Forester Plan Amendment #2 – Revised Riparian, Ecosystem, and Wildlife Standards for Timber Sales – 1995
- PACFISH – Interim Strategies for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California – 1995
- The Pacific Northwest Region Final Environmental Impact Statement for the Invasive Plan Program - 2005

Other Guidance for Management of the Project Area

This project is within the Grant County Community Fire Protection Plan, signed 2005, defined WUI boundary and is included in the Action Plan. The management objective as stated in the Grant County Community Fire Protection Plan is to enhance fire suppression capabilities by modifying fire behavior inside the zone and providing a safe and effective area for fire suppression activities.

The identification of this project within the Grant County Community Fire Protection Plan, places this project under the authority of the Healthy Forest Restoration Act (HFRA), signed 2003.

Public Involvement and Consultation

Consultation

Tribal consultation is ongoing with three American Indian Tribes with ceded lands or traditional use areas in the Dad's Creek Project Area. These are the Burns Paiute Tribe, The Confederated Tribes of the Umatilla Indian Reservation, and The Confederated Tribes of the Warm Springs Reservation of Oregon. The government-to-government consultation is being conducted under the terms of specific agreements with the individual tribes and includes regular contact and meetings as appropriate.

In 2008, the Forest Service provided National Marine Fisheries Service and U.S. Fish and Wildlife Service a program of work list for the three Blue Mt. Forests (Malheur, Umatilla, and Wallowa-Whitman). This list identified the Dad's Creek project as a project to be completed under the Section 7 Counterpart Regulations of the Endangered Species Act (Federal Register, December 8, 2003). Notification letters were mailed to NOAA and USFWS on August 1, 2008 stating that the Malheur National Forest intends to utilize the Section 7 Counterpart Regulations on the Dads Creek Wildland Urban Interface Project.

Coordination with Agencies, Communities, American Indian Tribes and Others

The Dads Creek WUI project has been listed on the Malheur National Forest Schedule of Proposed Actions since 2007. The SOPA is distributed to over 200 people, including a wide array of government agencies, interest groups, and interested individuals. The SOPA is also posted on the Malheur National Forest web site (www.fs.fed.us/r6/malheur).

On November 13, 2007, the Forest Supervisor and the District Ranger met with leaders of the Confederated Tribes of Warm Springs to inform them of and seek input about the Dads Creek WUI project. Another meeting was held in John Day on December 7, 2007, with local wildlife and fisheries biologists of the Confederated Tribes of Warm Springs to discuss the project and to listen to their concerns. A representative of the Warm Spring Tribe also participated during the collaboration with the Blue Mountain Forest Partners group.

Collaboration

The initial collaboration process for the Dads Creek WUI project spanned 12 months, starting in November 2006, when it was selected as the first collaboration project to be undertaken by the Blue Mountain Forest Partners. The group seeks to restore forest conditions to a healthier and less fire prone condition and to provide for a sustainable flow of forest products for the local economy.

The Blue Mountain Forest Partners (BMFP) organized in the summer and fall of 2006 and designated a sub-group to work with the Forest Service to design a restoration project in the Dads Creek subwatershed. The sub-group met in the project area in mid-November, 2006, to begin developing guidelines for the Forest Service to follow when designing the restoration actions. These guidelines were developed during a series of meetings by the sub-group and the Forest Service and then presented to the full BMFP group for agreement. Two documents were produced; the first was titled "Draft criteria for Forest Service consideration in preparing Dad's Creek Project Final Version", dated February 21, 2007, and the second was titled "Final Recommendations from the BMFP to the Forest Service" dated Sept. 7, 2007.

April 19, 2007, field trip with BMFP whole group to view private lands thinning, old growth with mistletoe, riparian treatments, and small diameter tree thinning.

July 23, 2007, field trip with BMFP sub-group to view thinning in a larger tree stand, smaller tree stands, stands with potential to convert old forest multi-story to old forest single story, and regeneration to seral species so that fire could be reintroduced.

A letter inviting people to attend a public meeting on November 15, 2007, was mailed on November 7, 2007, to approximately 160 individuals and groups. This included federal and state agencies, the Burns Paiute Tribe, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of the Warm Springs Reservation, municipal offices, businesses, interest groups, and individuals. There was also a newspaper article in the Blue Mountain Eagle on November 7, 2007, and notices on the local radio station notifying the public of the meeting. The purpose of the meeting was to provide information about the project and seeking public input in the planning of the project. It was attended by about 30 people.

Nov. 16, 2007, Public field trip was held to view riparian areas and old forest multi-strata stands and discussed potential treatments in these areas.

January 24, 2008, meeting with BMFP sub-group to discuss comments made during the scoping period and the Forest Service responses to them.

January 31, 2008, Public meeting to discuss comments made during the scoping period and the Forest Service responses to them.

There were substantial changes and improvements made to the Proposed Action based on the site specific information and concerns the collaborators brought to these meetings and field trips.

Scoping

On December 5, 2007, the Proposed Action that was developed through the collaboration process was sent out to the public mailing list. This included Federal, State and local agencies, Grant County Court, Tribes, permittees, nearby property owners, advocacy groups, and the general public.

The responses received are on file in the project record. Similar comments from different responders were combined and are listed below. Included in this list are the different ways that these comments were resolved and/or addressed within the document.

Issues

Issues for the Dads Creek Wildland Urban Interface project were identified through discussions with collaborators, public scoping, and internal input from project resource specialists. Similar items were combined into one statement where appropriate.

Normally, the issues identified during scoping are addressed by developing alternatives to the Proposed Action. Since this HFRA project falls within the WUI defined in the Grant County Community Fire Protection Plan, no alternatives to the Proposed Action are required. Instead the issues raised by comments received during the scoping and collaborative process were addressed by either modifying the Proposed Action, or by adding design criteria to the Proposed Action.

The issues were separated into three groups for the purpose of this analysis:

- Significant issues

- Analysis Issues
- Issues Eliminated from Detailed Study

The Council for Environmental Quality (CEQ) NEPA regulations give guidance (40 CFR Sec. 1501.7) to "…identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)." A definition of each issue group is discussed below:

Significant issues are defined as those directly or indirectly caused by implementing the proposed action; however, the effects cannot be reduced by normal Best Management Prescriptions (BMPs) or Project Design Features (PDFs). Usually an alternative is developed to address significant issues.

Analysis issues are defined as those directly or indirectly caused by implementing the proposed action; however, the effects could be reduced with normal BMPs and PDFs and an alternative was usually not developed to address these analysis issues. However, these analysis issues would be tracked in the relevant resource area effects analysis in Chapter 3 and in the Comparison of Alternatives section at the end of Chapter 2.

Issues Eliminated from Detailed Study are identified as those: 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 Interdisciplinary Team (IDT) identified potential issues and the Responsible Official approved those issues to be carried through the analysis as either significant issues or analysis issues in order to fully develop and allow further comparison of the proposed action and alternatives. An IDT issue identification summary document is in the project record files. The environmental consequences of the proposal are disclosed in Chapter 3 for each resource affected by the significant or analysis issues. Each issue has indicators to allow members of the public and the Responsible Official to determine how well issues are addressed by the alternatives (see Comparison of Alternatives section at the end of Chapter 2 for effects of the alternatives on issues). A discussion of all issue groups, specific issues and the indicator(s) for each issue is given below.

Significant Issues

After reviewing the public comments received during scoping no significant issues were identified by the Responsible Official.

Analysis Issues

Table 1-1 below lists the analysis issues considered for this analysis generated from public comments and/or the project interdisciplinary team.

Table 1-1 - List of analysis issues

Analysis Issue Topic	Analysis Issue Statement and Issue Indicator(s)
Treatment Priorities and Small Material Utilization	Proposed actions should restore areas that will provide the greatest gain (both ecologically and fire hazard reduction), and should strive to utilize small fuels rather than just burning it (biomass, firewood). Logging economics should not determine restoration priorities. ▪ The Forest is considering requesting Stewardship contracting approval for the Dad's project area. It is anticipated that the stumpage value of commercial material would cover some of the non-economical restoration projects. ▪ Smaller size material proposed for removal (to meet fuel reduction objectives) will be analyzed for biomass removal. ▪ A stand diagnosis map has been completed which shows treatment priorities for the project area. Treatment priorities on the map are based on fuel and vegetation condition. Indicator(s): 1. Percent change in crown fire initiation potential 2. Acres of commercial harvest 3. Acres of precommercial thinning 4. Acres of potential biomass removal 5. Percent unhealthy forest treated
Effects of Roads on Wildlife, Fisheries, Invasive Species and Noxious Weed Spread. Adjacency of temporary road construction to the Dixie Mountain Inventoried Roadless Area (IRA).	Proposed actions should limit road related impacts to wildlife and aquatic ecosystems. Temporary road construction can channelize water, cause erosion, and conduct invasive weeds. One proposed temporary road is located in close proximity to the Dixie Mountain IRA. This road may fragment wildlife habitat if not effectively closed. ▪ A roads analysis will be completed for the project area which will identify resource and safety issues associated with roads; primary uses of roads by the public and permittees; unneeded roads; and restoration needs for roads (i.e. maintenance, reconstruction, closure decommissioning). ▪ Some road restoration activities will be included in the analysis. existing closed/not drivable (grown in) roads will be reclosed if used, any temporary roads constructed will be rehabilitated after use, and roads with surface and drainage problems will be maintained or reconstructed. ▪ The temporary road located near the Dixie Mountain IRA will be re-contoured after use to discourage future motorizeduse. Indicator(s): 1. Miles of road maintenance 2. Number of temporary culverts installed 3. Miles of road maintenance within RHCAs 4. Miles of road reconstruction 5. Miles of temporary road construction 6. Miles of road within the project area 7. Open road density pre and post project 8. Effects to aquatic species 9. Miles of closed road opened for use and re-closed 10. Impacts on Dixie Mountain Inventoried Roadless Area

Analysis Issue Topic	Analysis Issue Statement and Issue Indicator(s)
Effects to wildlife Species by Reducing Cover and Converting Stands To Single-Strata	The loss of cover for wildlife with extensive under-story removal and thinning is a potential concern. The project area is used by deer and elk as a transition zone from summer to winter ranges and for fawning and calving habitat. Reducing stocking densities may have detrimental effects to wildlife by reducing hiding cover for both adults and fawns or calves, increased susceptibility to predation, loss of thermal-cover, and increased susceptibility to harassment by people. The harassment of elk on the forest may cause an increase in movement of elk to adjacent private lands and increase agricultural damage complaints. Not all stands should be converted into single-strata. Treatments should be patchy and leave behind more structure. Use variable density thinning techniques to establish a variety of microhabitats and break up fuel continuity. ▪ Thinning would be conducted to an average density of 50 sq. ft. basal area/acre. PDFs are proposed to ensure that thinning densities vary as much as 50% to maintain structural diversity for wildlife and visuals. Areas near private lands would be thinned to a lighter density. These are typically drier biophysical environments. At higher elevations farther away from the boundary, cooler and moister environments would be retained at higher densities ▪ A PDF would be proposed to retain unthinned areas for wildlife hiding and future snag recruitment. Unthinned areas would be left that are 3-5 acres in size and cover 5 to 15% of the area to be treated. In units immediately adjacent to the public/private boundary, patches would be retained at the 5% level. ▪ A potential Forest Plan Amendment is proposed in big game winter range to address project objectives. Indicator(s): 1. Size and acres of untreated patches retained within proposed units 2. Summary of Old Growth Analysis 3. Acres converted from OFMS to OFSS 4. Development of OFMS and OFSS in 50 years 5. Big Game Cover Analysis (percent cover)
Impact of Invasive Species and Noxious Weeds	Noxious weeds and other invasive species may be introduced on disturbed soils. ▪ PDFs are proposed to reduce the risk of invasive species/noxious weeds being introduced in the project area which includes washing off-road equipment before moving in and if moved from the southern weed infested areas to the northern portions of the planning area, avoiding prescribed burning in weed areas, using rock and gravel from weed free sites, reducing soil disturbance, and timing activities. Indicator(s): 1. Estimated acres of ground disturbing activities 2. Risk of spread (combined activities)

Analysis Issue Topic	Analysis Issue Statement and Issue Indicator(s)
Removal of Trees With Old Growth Characteristics, and GreenTrees and Snags with Value To Wildlife.	Thinning activities have the potential to remove trees that exhibit old growth characteristics or important value to wildlife. Trees that exhibit old growth characteristics regardless of species or size, should be retained as fundamental components of the areas forest ecosystem. Retain trees with characteristics important to wildlife such as hollow boles, and forked tops or broken tops. ▪ PDFs were developed to address this analysis issues. Some trees with these characteristics will be retained, but not all. A balance between leaving a healthy stand and wildlife habitat components is needed to meet project objectives. Trees with older form, thicker bark appearance will be retained, with the exception of trees near private lands trees with an abundance of mistletoe. ▪ All existing snags will be retained, with acknowledgment that some may lost during activities for safety reasons, and some may be lost during proposed underburning. It is anticipated that underburning will also create some snags in all diameter classes. Indicator(s): 1. Post treatment snags per acre 2. Projected snag levels in 50 years 3. DecAID tolerance level 4. Wildlife snag analysis determinations 5. Qualitative discussion on old tree retention
Effects on Soils	Road construction, ground-based logging, and large burn piles may impact soils. It is inconsistent with the achievement of project goals to require slash treatment machinery to have low ground pressure, but not also require similar low-ground impacts of logging skidders, tractors and other machinery. Steep slopes above 25% should not have any medium diameter or greater diameter trees removed. There should be no surface disturbing skidding or yarding across slopes greater than 25%. ▪ PDFs are proposed to reduce detrimental impacts to soils. No new system roads will be constructed. Temporary roads would be constructed to the minimum standard necessary to accomplish the job, and rehabilitated after use. Piles to be burned would consist of less than 3% of the surface area per acre (not counting landings). Skidders would not be allowed off skid trails unless the soil is frozen or other conditions approved by a soil scientist. Low ground-pressure logging equipment (<8.5 psi) would be allowed off skid trails under dry, frozen, or snow covered conditions. Steeper slopes (over 35-40%) would be harvested with a skyline logging system to reduce soil impacts. Indicators(s): 1. Comparison to Forest Plan soil standards

Analysis Issue Topic	Analysis Issue Statement and Issue Indicator(s)
Activity Timing and Effects on Species	Seasonal restrictions on thinning should be employed, prohibiting thinning and hauling during nesting and fledging periods for avian species. Avoid spring burning unless before reproduction season ▪ PDFs are proposed to address disturbance to goshawk nesting and big game. ▪ Project activities would be prohibited in occupied goshawk territories (fledgling areas and within ½ mile of know occupied nests) between April 1 and September 30 to avoid possible disturbance to goshawk pairs while bonding and nesting. ▪ Prescribed burning, precommercial thinning, and road work will be prohibited in known calving/fawning areas from May 1st to June 30th. ▪ From December 1st to April 1st, management activities would be restricted within big game winter range. No more than 10% of the total area of winter range may be disturbed at any one time, subject to approval by the District Ranger. Indicator(s): 1. Wildlife analysis impact determination (big game, nesting birds, goshawks and other raptors)
Consider Social and Economic Implications	Unemployment levels are high in the surrounding communities. Economically viable timber sales are important to local communities. ▪ These impacts are discussed in Chapter 3, in the Economics effects section. Indicators(s): 1. Value of commercial harvest (dollars) 2. Jobs from commercial or non-commercial project activities 3. Volume of economical viable timber harvest (cubic feet)

Issues Eliminated from Detailed Study

Table 1-2 below lists issues eliminated from detail study for this analysis and the rationale that led to their elimination:

Table 1-2 - List of issues eliminated from detailed study

Issue Topic	Issue Statement and Rationale for Elimination
Watershed Restoration	Some respondents requested that additional watershed restoration projects be included in the Dad's Creek Wildland Urban Interface project analysis. Respondents recommended that the Forest Service include projects that would reduce sedimentation sources, plant additional riparian shading vegetation, stabilize stream slopes, restore hydrological flow patterns and levels, improve stream bed cobble habitat for aquatic species, restore Oregon State (303(d)) listed salmonid waterways. ▪ The Dad's Creek Wildland Urban Interface Project is being completed under the authorities of the Healthy Forest Restoration Act (HFRA). This act has very focused objectives

	intended to reduce fuels in wildland urban areas. The proposed action was developed through extensive collaboration. During the collaborative process additional restoration projects were identified. Some limited restoration activities are included in the Dad's Creek WUI Project including aspen restoration and road closures. ▪ Additional restoration proposals are being considered for future environmental analysis based on public comments received during collaboration and scoping.
Effects of Livestock Grazing	Reduce the impacts of livestock grazing to allow establishment of ecological processes that will allow streams to recover. ▪ Changes in livestock grazing will not be considered in this analysis however, the effects of grazing will be considered in the cumulative effects analysis. Some adjustment in grazing may be necessary after prescribed burning to ensure adequate vegetation recovery. ▪ The Malheur Post Fire Grazing guidelines would be followed to determine when to resume grazing on areas treated with prescribed fire. These guidelines determine the minimum timeframes that an area would be rested from grazing following prescribed fire.
Cooperative Efforts on Private Lands	To meet "hazardous fuels" concerns such cooperative private lands efforts should be incorporated into this project. ▪ Proposing activities on private land is outside our jurisdiction. We can cooperate with State Agencies and private land owners. For example, if a private land owner wants to conduct burning on their property we can try to time our burning so that they have a black line to burn against.
Effects of Regeneration Thinning and Overplanting	The 28 acres currently planned for conversion to early seral species is inappropriate to the restoration and science based goals of this project. Over planting along with fire suppression has caused these stresses in the first place. Replanting should be avoided whenever possible giving preference to natural regeneration. ▪ Proposed tree planting is limited to a few acres. Within the 28 acres proposed for conversion to early seral species, only the areas that are partially or minimally stocked would be planted with seral species.
Effects of Large Diameter Tree Removal	The science for removal of crown bulk density to reduce fire risk is controversial at best, experimental evidence indicates crown bulk density removal may be ineffective or even contribute to more intense fire. Removal of larger mature trees would remove the most fire resistant trees that would otherwise perpetuate wildlife habitat and best ameliorate global warming. ▪ Thinning prescriptions would retain the larger diameter trees within the individual unit or stand. In thinning units all trees greater than 21 inches in diameter would be retained.

Economics Viability of Helicopter Yarding	If the area would require helicopter yarding, it probably should be left alone anyway as steep slopes are held together better if denser tree growth is allowed to persist. ▪ Helicopter yarding is currently not proposed and is probably not economical for small diameter thinning.
Effects to "De Facto Wilderness	Road building in National Forests and other public lands threatens the existence of "de facto wilderness". ▪ Management activities are not proposed in lands that meet potential wilderness inventory criteria found in Forest Service Handbook (FSH) 1909.12 Chapter 70- Wilderness Evaluation (71.1 – Inventory Criteria). ▪ No management activities are proposed within the Dixie Butte Inventoried Roadless Areas

Project Record Availability

This EA hereby incorporates by reference the Project Record. The Project Record contains Specialist Reports and other technical documentation used to support the analysis and conclusions in this EA. These Specialist Reports are for Soils, Watershed, Fisheries, Wildlife, Vegetation, Fire and Fuels, Economics, Botany, Recreation, Visuals, Heritage, Range and Invasive Plants for the Dads Creek Wildland Urban Interface Project. Relying on Specialist Reports and the Project Record helps implement the CEQ Regulations' provision that agencies should reduce NEPA paperwork (40 CFR 1500.4). The objective is to furnish enough site-specific information to demonstrate a reasoned consideration of the environmental impacts of the Proposed Action and how these impacts can be mitigated, without repeating detailed analysis and background information available elsewhere.

The Project Record is available for review at the Blue Mountain District, John Day, Oregon. Portions of the Project Record such as the Environmental Analysis, Appendices, and maps can be found on the website www.fs.fed.us/r6/malheur.

CHAPTER 2 – ALTERNATIVES

Alternative Development Process

This chapter describes in detail the Proposed Action that was developed with extensive collaboration under Healthy Forests Restoration Act (HFRA) authorities to meet the purpose and need to protect lives and property, as stated in Chapter 1 of this EA. Since this project is being prepared under HFRA authorities and treatments are wholly within the Wildland Urban Interface described in the Grant County Community Fire Protection Plan, no alternatives to the Proposed Action are required.

Rather than develop additional alternatives, the Proposed Action was substantially modified during the collaboration process using site-specific public input, including on-site visits with private landowners and interested members of the public, discussions with elected county officials, and interdisciplinary team knowledge of the planning area. The Proposed Action that emerged from the 12 month long collaboration process was primarily shaped by two main concerns; reducing the fire hazard and maintaining wildlife habitat. In some areas these two concerns could be reasonably met by minor design changes to the Proposed Action alternative. In others, it became obvious that fully meeting both concerns was not possible. Even then, a compromise was sought that would still provide some wildlife habitat while meeting the need to reduce fire hazard.

Alternatives and Treatments Considered but Eliminated from Detailed Study

Several alternatives and treatment strategies were considered during the planning process, but have not been included in the EA for detailed study. These are briefly described, along with the reasons for not considering them further.

No Temporary Road Construction

An alternative that would not construct temporary roads was considered early in the process but was dropped from further analysis due to line officer direction to the ID team. This alternative was considered to address concerns over constructing temporary roads identified during public scoping. Concerns identified include effects to soil and water quality, spread of invasive weeds, and ability to effectively rehabilitate temporary roads after use. The Interdisciplinary team field reviewed all temporary road locations and determined that there would be minimal impacts to soil and water quality since all roads would be constructed on gentle slopes and outside of Riparian Habitat Conservation Areas (RHCAs). Temporary roads would be constructed to minimum standard necessary to accomplish the job and effectively rehabilitated after use by a combination of subsoiling, installation of drainage structures; berming, and scattering slash and other debris. Several alternatives to constructing temporary roads were considered but eliminated from consideration. These include:

- Longer skidding distances to existing roads - Longer skidding distances in small diameter thinning stands would not be economical and may have greater soil impacts.
- Tractor skidding on steeper slopes - Skidding on steep slopes would potentially have greater soil impacts than constructing temporary roads and skyline yarding.
- No treatment of areas that temporary roads would access - Deleting areas from treatment would not meet the purpose and need to protect the lives and property within the rural/urban community interface adjacent to National Forest Lands.

Retain All Satisfactory Cover

An alternative was considered by the Forest Service (FS) that would avoid thinning in satisfactory cover stands. The FS acknowledges that satisfactory cover is limited in winter range, but determined that some thinning is necessary in satisfactory cover to reduce fuels immediately adjacent to the private land boundary. Without treatments near the Private Land/Forest Service boundary, the overall project objectives would not be met. The Forest Service discussed the tradeoffs of retaining satisfactory cover and reducing fuel levels near the private land boundary during collaboration. To address public concerns some proposed thinning areas were deleted to maintain wildlife security habitat. Impacts to wildlife would also be balanced with hazardous fuels reduction objectives, by thinning at variable stand densities and retaining unthinned areas for wildlife hiding and future snag recruitment. Unthinned areas would be left that are 3-5 acres in size and cover 5 to 15% of the area to be treated. In units immediately adjacent to the public/private boundary, patches would be retained at the 5% level.

Removal of Large Diameter (Trees >21 inches) With Mistletoe Adjacent to the Private Land Boundary

During collaboration and public meetings removing large diameter trees with mistletoe near the private land boundary was recommended to the FS. Removal of live trees greater than 21 inches would require an amendment to the Forest Plan, specifically:

Regional Forester’s Eastside Forest Plan Amendment #2

- Existing Standard: 6d (2) (a): “Maintain all remnant late and old seral and/or structural live trees >=21"dbh at currently exist within stands proposed for harvest activities.”

This amendment was not identified in the scoped proposed action, but was discussed during collaboration. This proposal was not fully supported by all participants during collaboration. After giving this alternative careful consideration, the Line Officer directed the ID Team to not propose removal of trees greater than 21 inches, however trees with mistletoe that are less than 21 inches in diameter would be removed near the private land boundary.

Seasonal Restrictions (Avian Nesting Season)

An alternative that would require seasonal restrictions during nesting and fledging periods for avian species was considered. It was recommended during scoping that all spring burning, thinning, and haul be completed outside of this period. Several restrictions are already proposed to reduce impacts to nesting goshawk, known calving/fawning areas, wintering big game, active raptor nests, and soils.

These include:

- Project activities would be prohibited in occupied goshawk territories (fledgling and post fledgling areas and within ½ mile of know occupied nests) between April 1 and September 30 to avoid possible disturbance to goshawk pairs while bonding and nesting.
- Prescribed burning, precommercial thinning, and road work will be prohibited in known calving/fawning areas from May 1st to June 30th.
- From December 1st to April 1st, management activities would be restricted within big game winter range.
- Protection of active raptor nest (other than goshawks) sites March 1 through July 31.
- Seasonal restrictions to limit some activities to dry or frozen soil conditions.

If additional timing restrictions are added, the line officer was concerned that there would be no reasonable work window to complete proposed activities. The FS acknowledges that there may be some potential impacts to nesting avian species. These impacts will be disclosed in the analysis.

Restoration Only (No Commercial Thinning)

Specifically, this alternative would not conduct commercial thinning, but would propose prescribed fire and pre-commercial thinning activities. No temporary roads would be constructed, however road closures would be proposed. A Restoration Actions Only Alternative would not meet the primary purpose to protect lives and property within the rural/urban community interface adjacent to National Forest lands. Without commercial thinning, crown fuels and ladder fuels would not be reduce to the level desired to reduce hazardous fuels from the area.

Alternatives Considered in Detail

No-Action (Alternative 1) allows the current situation to continue and the forest would remain subject to natural or ongoing changes. The project area would receive no fuels reduction treatments at this time.

The Proposed Action (Alternative 2) was developed using a collaborative process with the Blue Mountain Forest Partners collaborative group, local residents and other interested parties to meet the Purpose and Need and other multiple resource needs.

Maps of the existing condition and the Proposed Action Alternative are provided in Appendix B. Additional maps are included that display the anticipated effects of both No-Action and the Proposed Action alternatives. Larger-scale maps of the alternatives are contained in the project planning record.

Alternative 1 (No Action)

This alternative proposes no timber harvesting, precommercial thinning, or fuels reduction treatments in the Dads Creek Wildland Urban Interface Project Area at this time. It does not preclude activities in other areas at this time or from the Dads Creek Wildland Urban Interface Project Area at some time in the future.

This No Action alternative represents the existing and projected future conditions that would develop if the current management situation continues. The maps for Alternative 1 show the current distribution of stand structure and crown fire initiation potential (see Maps 5 and 7 in Appendix B) and the expected conditions in 50 years with no treatment (see Maps 6 and 8 in Appendix B).

The No Action Alternative would have no outputs, provide no opportunities for employment, and does not meet the purpose and need for the proposed action. The No Action Alternative does not move the project area towards the desired condition and does nothing to reduce the fire hazard in the wildland urban interface.

Alternative 2 (Proposed Action)

The Proposed Action was developed as an iterative process involving National Forest staff, the collaborators, and comments from the public scoping process. As stated in Chapter 1, the purpose of this project is to protect lives and property within the wildland-urban interface. The two main tools that are available to accomplish the objective are prescribed burning and mechanical treatment (thinning, slash piling, etc.). Since most of the project area has not burned in the last 100 years, the accumulation of ground fuels and growth of numerous small trees has created conditions where the re-introduction of fire across the whole landscape would likely be too damaging and be hard to control. A few areas have been treated in the eastern portion of the project area and are presently in a suitable condition to be prescribed burned. Elsewhere, to be able to safely burn, a number of mechanical treatments need to be completed before either prescribed fire or naturally occurring fires can be allowed to burn.

The first step was to determine which stands were in a healthy condition and a low fire hazard and which needed treatment to bring them into the desired condition. This process identified approximately 2/3 of the forested area that were in an unsuitable condition and in need of mechanical treatment,. An overall strategy was developed that focused the mechanical treatments in the following priority areas:

- Near private lands, to protect lives and homes.
- Along main travel routes, to maintain access along major highways in and out of the county.
- On ridgetops, where there are better opportunities to safely control fires.

At the same time, a network of wildlife connectivity corridors was designed to connect the late and old forest stands to meet Forest Plan Amendment #2 standards. Throughout the process the connectivity corridors were located to minimize conflicts with fuels reduction needs along the public/private boundary.

Approximately 2,532 acres of underburning was identified in areas that are predominately ponderosa pine and where current conditions allow prescribed fire to be used to reduce the ground fuels, and to some extent, also the ladder fuels. These have been included in the Proposed Action and are planned to be done within the next ten years. Multiple entries may be required to reach the desired results and these may occur within the same ten years.

In the rest of the project area burning is not planned to start until the mechanical treatments are completed. Once fuel loads are reduced, the long-term desire is to keep fire risk low in the wildland-urban interface. Since the generally accepted life of a NEPA document is approximately 10 years, the anticipated follow-up long-term maintenance burning (greater than 10 years) proposed for the Dads Creek WUI is not included in this document. An additional NEPA document would be prepared for the burning that would be necessary to maintain the stands treated by the proposed action in a healthy and low fire hazard condition.

Throughout the collaboration process, a number of refinements based on site specific knowledge of fuel conditions, proximity to private lands, and wildlife use patterns were made to the general plan to balance the objective to reduce the fire hazard while still providing for wildlife habitat. See Chapter 1, pages 9-11, for a more in-depth discussion of the collaboration process and an overview of the various decisions involved in developing the proposed action alternative.

The proposed action is designed to reduce the fire hazard and improve forest health in the Dads Creek WUI project area by reducing fuels and modifying the spatial distribution of the fuels in the three fuel layers:

- Crown or canopy fuels would be reduced primarily by commercial thinning (when too dense) and convert to early seral species treatments (where tree species are not suitable or sustainable). The trees to be cut are often large enough to be utilized for commercial products.

- Ladder fuels would be reduced by commercial and precommercial thinning treatments and understory removal. The trees cut would vary in size from medium to smaller diameters and some of the smaller sizes may be difficult to economically utilize for products, utilization will be pursued if the opportunity exists.
- Surface fuels would be reduced by one or more of the following methods:
  - Whole tree yarding for utilization or disposal of the tops by burning.
  - Biomass utilization will be used to reduce a portion of the surface fuels when economically and ecologically feasible. The material would be removed from the units either by skidding or a forwarder to a landing. The method of removal would need to be approved by the local soil scientist.
  - Hand piling of natural and project generated fuels in excess of levels safe for future prescribe fire, followed by burning of the piles.
  - Grapple piling of natural and project generated fuels in excess of levels safe for future prescribe fire, followed by burning of the piles.

Approximately 3890 acres would receive treatment, including 2,668 acres of mechanical treatment (1,811 acres of commercial harvest, 799 acres of precommercial thinning and 58 acres of old growth fire hazard reduction), followed by 2,668 acres of fuel treatment by piling and burning, and 2,532 acres of fuel treatment by underburning (1467 acres in harvest and thinning units and 1065 outside of treatment units). See the table in Appendix A and the maps in Appendix B for specific unit by unit information.

Treatments would occur on about 1/3 of the project area, combined with past harvesting the total area treated is approaching 1/2 of the project area. Current thinking is that you need to treat a minimum of 1/4 of the area to have an effect on fire behavior. Therefore this amount of treatment is expected to be enough to make a positive improvement in protecting lives and property. It is felt that more treatment would begin to adversely impact other resources, like wildlife habitat, while less treatment would not be sufficient to reduce the fire hazard to an acceptable level.

Commercial fuel reduction treatments would be accomplished by generally thinning the smaller diameter trees and retaining the larger trees at a variable spacing. There would also be some species conversion from fire and insect prone late seral species to more resistant early seral species both by selective thinning and by regeneration harvesting. The focus of the thinning would be largely on smaller diameter trees found either below the main forest canopy or within the canopy where tree crown density would allow the spread of crown fire. Mechanical treatments would remove ladder fuels that carry fire into the tree crowns.

All live trees over 21” diameter at breast height would be retained, except where removal is necessary for safety or to construct temporary roads and landings. Material to be removed for utilization would be brought to the road system by either skyline cable yarding, or ground based equipment. The objective of this proposal is to use the existing transportation system as much as possible and maintain it as necessary to reduce the potential negative impacts to water and wildlife habitat.

Precommercial falling and removal (through piling/burning or removal from site) of small diameter trees would also reduce ladder fuels and the continuity of the tree crowns. This is proposed both within the areas treated by the commercial fuel reduction treatments and in areas where there is little commercial material but there is still a need to remove the smaller trees.

Activity Descriptions

Commercial Harvest

A variety of mechanical vegetation treatments are prescribed to reduce the fire hazard and to promote forest health. (Table in Appendix A and Map 10 in Appendix B) Treatment prescriptions were determined on a site specific basis considering the biophysical environment, current condition of the stand, other resource concerns, and the location. All trees 21” diameter at breast height (dbh) and larger would be retained to keep a varied stand structure (multiple age classes) across the landscape to mimic a more natural appearing forest. The only exceptions would be for road or landing construction or to fell hazard trees.

- Commercial Thinning – 1421 acres
- Understory Removal (Thinning from below in multi-story stands) – 362 acres
- Conversion to early seral species – 28 acres

The commercial thinning reduces ladder and canopy fuels and promotes ecologically appropriate species composition and structural conditions in order to increase resiliency currently lacking across the planning area. This prescription would thin small/medium size trees (7 to 20.9” dbh) in immature forest stands by thinning from below to reduce stocking levels to reduce canopy fuels, enhance individual tree growth, and to allow for the reintroduction of fire. Thinning from below means the majority of the trees to be cut are in the smallest diameter sizes (9 to 14” dbh) and relatively few trees would be cut in the medium diameters (15 to 20.9” dbh). An additional objective in mixed species stands would be to select for retention of fire adapted early seral species (ponderosa pine and western larch) and reduce the proportion of fire susceptible late seral species (Douglas-fir and grand fir). Commercial thinning would reduce the competition among trees for sunlight, water, and nutrients resulting in more vigorous, healthier forest stands.

The conversion to early seral species treatment seeks to reduce the effects of fir ingrowth into stands that historically had a frequent fire return. These stands are presently in a condition where fire would most likely cause high mortality, the objective is to return it into a condition where fire can eventually be re-introduced and allowed to play its natural role. It would remove late seral species trees from the middle and understory, thin early seral species trees where they are over stocked, and reforest any resulting understocked areas to historic stocking levels. Where early seral species trees are not available, a minimum of 20 trees per acre would be left to provide structural variety and future large snag recruitment.

Understory removal is basically a thinning that removes both commercial and precommercial sized trees (1" to 20.9" dbh) from multi-storied stands. The result is a thinning from below to reduce ladder and canopy fuels and to enhance the survivability of the larger trees in the stand from fire and insect attack.

Variable Spacing in Understory Removal and Commercial Thinning Treatments

To enhance structural diversity for wildlife and visuals while reducing fuel loadings, trees would be left at a varied spacing, as opposed to even spacing, with the density varying as much as 50% across the stands. Higher tree density and unthinned areas should provide higher levels of security/hiding cover in the short-term. Lower density areas will open up forest stands, breaking up the fuel continuity and allowing for fire adapted understory shrub species to regrow. Conifer seedlings that regrow in the increased sunlight will be controlled by periodic prescribed burning so that they do not become overcrowded in the future. The burning will create a mosaic by killing some of the young trees, but some patches will survive the burning to provide young trees for future hiding cover and stand diversity.

The thinning would be to lighter densities near the private lands and in the drier biophysical environments and at higher densities farther from the boundary and in the cooler and moister environments. See the Design Measures, Silviculture section and the individual unit information in the table in Appendix A for more details on the variable densities to be left.

Unthinned areas are to be left for wildlife habitat that are 3 to 5 acres in size and cover 5 to 15% of the area to be treated. In units immediately adjacent to the public/private boundary, retain unthinned patches at the 5% level. Retain all snags that are not safety hazards. Future snag replacements will be created by the prescribed burning.

Retention of Medium Sized Older Trees

Occasionally trees are found that are less than 21" dbh but are obviously older than the second growth trees in the rest of the stand. Often they are growing near old growth trees that are over 21" dbh and would normally be removed during thinning and understory removal treatments to reduce competition with the larger trees. Several comments were received that stated these trees were valued highly by the respondents as trees that could soon grow into trees over 21". These medium sized trees generally lack lower branches and do not pose a ladder fuel risk, and they comprise a relatively minor component of the forest. Therefore, they are not considered much of a fire hazard and most are to be retained.

Likewise "wolfy" trees with stem damage, poor form, broken tops, or numerous large branches are to be left for wildlife habitat, at approximately one per acre, when available.

Logging Systems

In keeping with the objective to keep road construction to a minimum, logging systems were designed to use the existing road network whenever possible. The portion of the project area northwest of highway 26 was originally accessed in the early part of the 20th century by railroad grades and was logged using horses. Some roads were constructed later, but the present system does not provide good access at the present time to all the planned harvest units. Several short temporary roads will be needed to access these units; they will be closed after being used for this entry. See the table in Appendix A and Map 11 in Appendix B for individual unit information. The numbers below include areas planned for biomass removal as well as for sawlog yarding.

- Tractor (including skidder or forwarder systems) – 1290 acres
- Tractor/Skyline - 227 acres
- Tractor/Tractor Winch – 401 acres
- Tractor Winch – 25 acres
- Skyline – 124 acres

Road Construction and Maintenance for Proposed Action

Approximately 44 miles of existing open and closed roads will be used for log haul.

- Road maintenance for haul use – 44 miles
- Installation of 9 temporary culverts
- Temporary road construction and rehabilitation after use - There are 5 temporary roads (200 yd to .95 mile long) being planned to access harvest units that total approximately 1.8 miles in length. These are to be rehabilitated after this project.
- Opening of closed system roads (to be re-closed) – 30 miles

To accomplish timber harvest activities, temporary road construction and commensurate use road maintenance would occur to provide adequate access for harvest and fuel treatment. The roads planned to be used for haul are shown on Map 12 in Appendix B. Commensurate use road maintenance means the amount and type of road maintenance performed will depend on the existing road condition, the season of use, and other factors.

The following work is classified as maintenance under the definition listed in the Federal Register but will be listed as reconstruction in any timber sale contracts: construct new drainage dips, construct new waterbars, construct new outlet ditches, place geotextile on existing road surface, place fill material in ruts in road, repair or replace existing cattle guards, removal of small trees and stumps

Typical road maintenance could include: blade and shape roadbed, reshape drain dips or grade sags, reshape waterbars/cross ditches, spot rocking in roadbed, brushing, remove hazard trees, minor realigning of road junctions, cleaning culverts, seeding, and remove excess material from roadbed.

These maintenance actions would be done on both open and closed roads as needed for harvest activities and fuel treatments. Roads that are currently closed but needed for proposed actions (approximately 30 miles of road) would be opened temporarily and reclosed after project activities are concluded. Nine temporary culverts would be installed and removed after project completion. Road closures for roads that are closed and grown in or otherwise undrivable will be implemented by constructing an earth berm at a logical location at or near the road junction. Additionally, the roadbed will be covered with natural materials such as logs, rocks, slash/brush, etc., where available, for a distance deemed to prohibit vehicle use. If natural material is not available in quantities needed to effectively close the road, one or more additional earth berms will be constructed in a series behind the first earth berm.

Temporary roads would also be needed to support timber harvest. All temporary roads would be rehabilitated after use. Rehabilitation would eliminate future use of the road with the objective of restoring hydrological function. This will include re-contouring, subsoiling, and seeding as necessary and discouraging continued use by constructing an earth berm or placing large rocks and slash at the entrance.

Post Harvest Treatments

Subsoiling

Commercial harvest units 14, 38, 58, 84, 86, 94, 96, and 112 and biomass utilization units 68, 72, 152, 156, 166, 170, 172, and 280 may be subsoiled or harvested on frozen or snow covered soil. If further monitoring indicates that the Forest Plan detrimental soil disturbance threshold of 20% can be met without requiring these measures, they will be waived.

Small Tree Removal

Following the convert to early seral species treatment in unit 78, there would be small Douglas-fir and grand fir trees remaining that are undesirable for future management. Trees would need to be cut up to the lower diameter limit in the timber sale, this is anticipated to be 9” dbh, but may be larger or smaller depending on the economics at the time of logging. These small trees would be cut, the fuels reduced to target levels, and the non-stocked areas greater than ½ acre in size would be reforested with early seral species such as ponderosa pine and western larch tree seedlings. Planted areas would be monitored for growth and survival and additional measures to achieve acceptable reforestation may be necessary.

Understory Removal Areas

Following these thinning treatments of commercial sized trees, there is expected to be a number of stands with an understory of non-commercial trees that would need to be removed to meet the fuels and ladder fuels objectives. Actual need for treatment would be evaluated after the commercial harvesting is complete and only those areas in need of further treatment will be thinned.

- Precommercial Thinning and Fuel Treatment – 362 acres

Activity Fuels Treatments

There are several methods proposed to treat the logging and precommercial thinning wood residue (see Table in Appendix A):

- Whole Tree Yarding – 1145 acres
- Whole Tree Yarding/Grapple Piling – 334 acres
- Whole tree Yarding/Hand Pile – 332 acres
- Grapple Pile – 493 acres
- Hand Pile – 206 acres
- Swamper Burning – 58 acres
- Biomass Yarding – 605 acres (if commercially viable)

Yard tops attached and whole tree yarding is done during the logging operations. Both methods bring the top and limbs to the landing where it can be utilized as biomass, or if there is no market, it is piled and burned. Grapple piling is done with a grapple mounted on a low ground pressure (<8 psi) track excavator and is restricted to slopes less than 35%. Grapple piling is used in areas with moderate to high fuel loads. Hand piling is primarily used on slopes greater than 35% with moderate to high fuel loads. Piles from both methods are burned in the late fall after sufficient moisture has fallen to minimize fire spread.

Biomass Utilization

The objective of this project is to utilize as much of the vegetative material that is cut as is economically possible. Tradeoffs include the possible increased soil compaction compared with less smoke created and less soil impacted by pile burning.

Two methods of biomass removal from units could be used. One is like current harvest methods, using feller-bunchers and skidders. This method could be used at the same time as the commercial harvest, or it could occur later. The second method is to use low ground pressure forwarders and other machinery on more closely spaced trails. No method of utilizing biomass from steep slopes is currently economically viable.

At the present time it is uncertain that a significant amount of material will be utilized, but this analysis will be done considering that the economic situation may allow biomass removal from 605 acres and utilization of landing pile material.

Precommercial Thinning

The precommercial thinning prescription is recommended where the small trees to be cut (1” to 9” dbh) are not economically merchantable sawlog material. The objective is to reduce ladder fuels, reduce the amount of live and dead fuels, and increase tree growth.

- Precommercial Thinning to 9” dbh – 799 acres
- Precommercial Thinning in Commercial Thinning units – 666 acres

The spacing of leave trees in the areas to be precommercial thinned would also be varied by as much as 50% to provide a variety of habitats and visual diversity.

There may be utilization of the small precommercial diameter material that is cut for products such as posts and poles, firewood, and biomass fueled co-generation of electricity. Likewise, the tops, branches, and other woody biomass that are yarded into landings for fuel reduction in harvest units will also be made available for utilization. Local markets are limited and hampered by marginal economics, but efforts will be made to utilize the woody biomass generated by this project rather than dispose of it by burning.

Fire Hazard Reduction in Designated Old Growth

The purpose of these treatments is to reduce the risk of loss of old growth trees due to wildfire, while maintaining the habitat requirements of old growth dependent wildlife species. Treatments will occur in selected dedicated old growth stands, up to 40% of the area, in clumps where large >21” dbh ponderosa pine, western larch or Douglas fir exist. No clump would be larger than three acres and they would be scattered throughout the unit where concentrations of old growth trees exist.

None of the trees cut will be removed for commercial products (biomass or sawlogs).

All trees less than 9” dbh within each old growth clump will be thinned to an average 26 feet spacing. The spacing will be varied as much as 50% to select early seral species (such as ponderosa pine and western larch) which are the preferred leave trees.

Within 10’ of the drip line of old growth late seral tree species (such as Douglas-fir and grand fir) 9” dbh to 15” dbh will be either cut or girdled. Girdled trees should have few lower limbs or will have their lower limbs pruned. Felled trees will have limbs and tops removed.

Slash generated from these treatments will be jackpot/swamper burned during times when the ground and fuels are moist. Small fires would be started and the surrounding slash would be fed to the fires. This would better protect the old growth trees and snags from damage compared to other slash treatments.

Units to be treated:

- #206 - 26 acres (40% actual treatment area = approx 10 acres)
- #208 - 28 acres(40% actual treatment area = approx 11 acres)
- #209 - 35 acres (40% actual treatment area = approx 15 acres)
- #211 - 27 acres (40% actual treatment area = approx 11 acres)
- #212 - 8 acres (40% actual treatment area = approx 3 acres)
- #214 - 21 acres (40% actual treatment area = approx 8 acres)

Total = **145 acres** (40% actual treatment area = **approx 58 acres**)

Prescribed Fire

Prescribed burning would be done to reduce surface fuels, reduce litter and duff depth, and increase canopy base height. Underburning is best used in areas with lighter fuel loads and is done over relatively large areas to reduce the need for constructed fire lines. Pile burning will be done in thinning areas to reduce the fire hazard created by cutting and/or harvesting trees. Swamper burning will be done under moist conditions in the designated old growth treatment areas.

- Underburning – 2,532 acres
- Pile burning – 1365 acres
- Landing pile burning – estimated 180 landings
- Swamper burning – 58 acres

An estimated 2,532 acres has been identified in the 7,200 acre project area where underburning can be done within the next ten years. Due to the buildup of both live and dead fuels, approximately 1,467 of the 2,532 acres would need mechanical treatments before burning can be done. Future maintenance burning would be needed to limit regeneration and maintain low levels of surface fuels. Burning additional areas (outside of the 2,532 identified acres) would be desired in the future.

The 2,532 acres of underburning was identified in areas that are predominately ponderosa pine and where conditions are presently suitable for burning. The first burns would need to be accomplished in the spring due to the fuel buildups, once the fuel is reduced “maintenance burning “ would be mostly be done in the fall when weather and moisture conditions are appropriate. Ignition would be by hand or by using ATVs. Underburning occurs in a mosaic fashion and not all acres are blackened at any one time. Multiple underburning entries over the next 10 years may be needed to reduce the fuels to the desired fuel composition, and towards conditions for maintenance burning.

Burning would occur in two allotments; Dixie and Reynolds and would be coordinated with the permittees. The recovery of vegetation, including forage production and species diversity, would be monitored after prescribed burning using forest guidelines to determine when the burned areas can be grazed again.

The varied spacing proposed for the commercial thinning, understory removals, and precommercial thinning would leave up to 15% of a unit unthinned in patches that are 2 to 5 acres to provide security/hiding cover. During the underburning, the objective is to avoid mortality in these identified patches. The method to minimize mortality in these patches would be determined by the burn boss at the time of implementation.

Prescribed fire is not proposed in any of the replacement old growth (ROGs) or post fledgling areas (PFAs) within the project area. Portions of the designated old growth (DOG) will have swamper burning to reduce slash loads after thinning.

Approximately 111 acres of late and old structure (outside of DOGs and ROGs) are within areas prescribed for underburning. Underburning in these areas would be low intensity with the objective of reducing surface fuels while minimizing tree mortality, especially in the larger trees. Methods to protect large trees can include raking the litter and bark accumulation away from the base of the tree, not burning areas where concentrations of large trees exist, burning when duff moisture under the larger trees is sufficient to not cause damage to the base of the tree or damage fine roots close to the surface.

An estimated 1365 acres of pile burning has been identified in areas where fuel loads are in excess of levels safe for underburning and where the option for utilization of the material may be unavailable. Piles will be created by hand on slopes greater than 35% and by grapple machines with a ground pressure less than 8.5 psi on slopes less than 35%. Piles will be burned under moist conditions when fire is limited primarily to the pile location. Piles will be located so that damage to any residual trees will be minimal during burning. While pile burning does create intense heat to the soil surface and may sterilize the soil, piles will be limited to less than 2% of the total surface area of a treatment unit.

An estimated 180 landing piles will need burning. The material in these landing piles is available for utilization and this may reduce the overall amount of landing pile burning. Piles will be burned under moist conditions when fire is limited to the pile location. Piles will be located so that damage to any residual trees will be minimal during burning.

Prescribed fire in the form of swamper burning is proposed in an estimated 58 acres of the designated old growth (DOGs). Swamper burning is performed in areas where slash levels exceed levels safe for underburning. A concentration of slash is ignited under moist conditions and then the remainder of the excess slash in the area is added to the pile as it burns. Less than 2% of the total surface area of the treatment unit will be impacted by the burning of these slash concentrations.

Ignition will occur within some of the RHCA’s. Ignition will stop at the slope break of the riparian channel. This will give the burn personnel more control over the burn intensities within the RHCA’s to minimize the severity on soils and riparian vegetation. Past district experience has shown that when fire is allowed to back into RHCAs the effects are dependent on the existing vegetation. As soon as vegetative species and moisture regimes within the RHCA change and become more shaded with more moisture and higher humidity, the fire would not burn, so riparian vegetation is rarely affected. Shrubs and conifers providing streamside shade and riparian vegetation are rarely affected because they do not burn with enough intensity to cause mortality. Overall burn severity in the RHCA’s will be monitored by the fish biologist or hydrologist to assess the effects across the many RHCA’s that may be in a burn block for potential cumulative effects.

The objectives of utilizing prescribed fire are to reduce surface fuels, reduce litter and duff depth, and increase canopy base height. Prescribed fire is not being utilized to change the structural stage of any the stands. Some tree mortality is expected and acceptable in forested stands. Acceptable mortality ranges are listed in the Design Criteria section.

Control lines for prescribed burning would include existing roads whenever possible. Hand line may also be constructed for control lines adjacent to private lands and to tie one road to another. Fire lines on slopes greater than 25% will be water barred. Fire lines will not be used in RHCA's. Other methods to contain fire within the RHCA's will be used such as black line.

During project implementation, burning would adhere to the Oregon Smoke Management Plan and the State implementation Plan of the Clean Air Act.

Alternate Snowmobile Route

The snowmobile route on the 2600087, 2600306, and 2600318 roads may be needed for log haul during the winter. Use would be suspended during log/biomass haul. Other existing routes nearby will be designated to provide for use by snowmobiles during the winter.

Associated Actions Included In Alternative 2

Sumpter Valley Railway Interpretative Site

Modified thinning is planned in Unit 100 to open up views of the Strawberry Mountains to the south of the planned Sumpter Valley Railway Interpretative Site parking area relocation and picnic area.

Aspen

Fencing the small aspen patch in unit 34 is planned to reduce grazing and encourage sucker survival. Several conifer trees that are shading the aspen may also be cut or girdled and left in place. Any slash created by tree cutting will be hand piled and burned.

Forest Plan Amendments

Reduce Winter Range Satisfactory Cover below Forest Plan Standards

The Proposed Action would slightly reduce satisfactory cover below Forest Plan standards on 8 acres in the Dads Creek subwatershed. The existing winter range satisfactory cover is already below Forest Plan standards, the reason it is being further reduced is to respond to the collaborators desiring treatment in the designated old growth to make it more sustainable. Of the 58 acres being treated in the Designated Old Growth (DOG) approximately 8 acres is in winter range. The amount is small, as shown in the percentages in Table 2-1 below, but it is a decrease so a non-significant Forest Plan amendment is required to reduce cover below standards.

Table 2-1 Cover in Dads Creek Subwatershed

Cover	Forest Plan Standards		Existing Cover		Cover After Treatment	
	Summer Range	Winter Range	Summer Range	Winter Range	Summer Range	Winter Range
Satisfactory	12%	10%	22.7%	6.27%	15.4%	6.26%
Marginal	5%	10%	43.3%	38.8%	23%	29.1%
Total	20%	25%	66%	45.1%	38.4%	35.3%

Cover is reduced to meet the purpose and need of reducing fire risk in the Dads Creek Wildland Urban Interface. Portions of the Designated Old Growth are planned to be non-commercial thinned (see page 13) and are currently satisfactory cover. This thinning is at the request of the Blue Mountain Forest Partners to provide an increased level of protection for old growth trees.

Most of the treatments would occur in Dry Forest types. These stands are considered outside the historic range of variation (HRV), i.e., overstocked and likely unsustainable given the high risk of uncharacteristically severe fire and insect epidemics. Most of these stands would likely fall out of cover within the next 25 years if not treated. In a 2003 letter to the Eastside Forests, the Regional Office provided direction encouraging Forests to use site specific Forest Plan amendments to move the landscape towards HRV (USDA FS June 11, 2003).

Adjust and Expand Dedicated Old Growth Area (DOG) and Create a New Replacement Old Growth (ROG) *(see Map 9 in Appendix B)*

The existing DOG is located immediately adjacent to the National Forest boundary and is less than the recommended 300 acre minimum size. The DOG is overstocked with trees and is high risk to wildfire and insect epidemics and is not within the HRV. The “Healthy Forests Initiative and Healthy Forests Restoration Act, Interim Field Guide, February 2004, states “One of the keys to effective fire management is treating fuels adjacent to structures and on private and Federal land throughout the wildland-urban interface (page 34, caption to figure 19).

Management Area (MA-13) direction for old growth prescribes management to reduce residues and to maintain or enhance old growth and to protect old-growth from catastrophic wildfires. In a 2003 letter to the Eastside Forests, the Regional Office provided direction encouraging Forests to use site-specific Forest Plan amendments to move the landscape towards HRV (USDA FS June 11, 2003).

It is proposed to move the DOG uphill away from the National Forest boundary and to expand its size to approximately 322acres. Approximately 43 acres along the boundary that was formerly designated DOG will be treated to reduce the amount of understory trees and convert it from old forest multi-story to old forest single-story.

Originally, there was no ROG designated. This project proposes to designate one that would be approximately 250 acres in size. Refer to Map 9 in Appendix B for the locations of the new DOG and the ROG.

Design Elements

Wildlife

Down Wood, Woody Debris and Large Logs

- Retain the woody-debris listed in Table 2-2 below, where they currently exist. Since much of the landscape is deficient in down logs, most existing large down logs (logs greater than 12") would be retained during harvest and grapple piling activities.
- Protection of large logs would be an objective during underburning. Design prescribed fire parameters to limit the burning of large down logs to a point where their diameter is reduced by no more than a total of 3 inches.

Table 2-2 - Forest Plan Standards for Down Woody Debris

Species	Pieces per acre	Minimum Diameter at Small End (inches)	Minimum Piece Length	Total Length feet/acre
Ponderosa Pine	3-6	12"	>6 feet	20-40-ft.
Mixed Conifer	15-20	12"	>6 feet	120-160-ft

Dead Trees

- Retain wildlife snags (dead trees) at levels to provide for 100% population levels of primary cavity excavators. Within the ponderosa pine, mixed conifer, and true fir communities, retain a minimum of 2.39 snags per acre, 21 inches dbh or greater. If 21-inch dbh snags are not available, retain 2.39 snags per acre of the largest representative diameter. Since conditions are generally below Forest Plan standards all commercial harvest and precommercial thinning activities would retain existing snags greater than or equal to 12 inches DBH, except where they create a safety hazard. Standing dead trees which present a safety hazard would be felled and left in place."
- To help protect snags 12 inches dbh and greater, take advantage of variable spacing in thinning units to retain more live trees around the snags.
- Retain trees damaged during logging operations in harvest areas lacking in snag habitat, unless determined to be a safety hazard.
- To help retain wildlife snags during prescribed burning operations, there will be no ignition within 50 feet of standing dead trees > 12" dbh. Larger snags can be of greater value to some primary cavity excavators and less easily replaced if destroyed.
- Within conversion to early seral species (HRS) units retain a minimum of 15 to 20 trees per acre, 12 inches dbh or greater for green tree replacements. More than

a sufficient number of green tree replacements are expected to be retained in all other harvest, precommercial thinning and prescribed burning activities.

Raptors (birds of prey)

- To conserve habitat of the goshawk, no treatments involving timber harvesting or other cutting are proposed in suitable nesting habitat around existing goshawk nests. Specifically, 30 or more acres of the most suitable nesting habitat surrounding each active and historical nest tree are deferred from any cutting. Additionally, 400-acre post-fledging areas surrounding goshawk nests would only be underburned so as to enhance goshawk prey conditions and advance these stands toward late or old structure conditions.
- Project activities, including but not limited to, all Forest Service and contracted activities such activities as timber harvest, precommercial thinning, prescribed fire, and roadwork, would be prohibited in occupied goshawk territories, (post-fledgling areas and within ½ mile of a known occupied nests), between April 1 and September 30 to avoid possible disturbance of goshawk pairs while bonding and nesting.
- To conserve nesting habitat of raptors (birds of prey), a biologist would be consulted to establish a nest zone buffer around any raptor nest discovered prior to or during project layout, and, if appropriate, to restrict activities within the nest area during occupancy, according to requirements of the species involved.
- Maintain the nest trees of active raptor nests and habitat immediately surrounding and mitigate potential adverse impacts from management activities during the nesting season. Protection measures will be developed based on site characteristics and biological needs of the species. Where possible, retain trees with inactive nests that may be important to secondary nesters (e.g. great gray owl).
- In the Goshawk post fledging area (PFA), if treatment is prescribed. Develop structural diversity for wildlife habitat by varying tree density up to 50%. Retain a minimum 15% of the stands, if available, in untreated patches ranging in sizes from 3 acres to 5 acres.
- Raptors are particularly sensitive to disturbance during the reproduction season. See Table 2-3 below which displays seasonal restriction and nest protection standards for known raptor nests.
- District wildlife personnel will be contacted for up-to-date raptor nest locations and activity status before implementation of management activities. Unoccupied sites require no timing restrictions.
- Effects to raptors can vary depending on the loudness and duration of the management activity and the topographical or vegetation screening between the management activity and the nest tree. This EA permits waiver or adjustments to seasonal restrictions if recommended by the District wildlife biologist and approved by the District Ranger.

Table 2-3 - Summary of Raptor Timing Restrictions

Description	Timing-Activities Prohibited	Buffer for Timing-Activities Permitted	Timing – Activities Permitted	Management Restrictions At All Times
Occupied goshawk nest sites	Activities are prohibited: April 1-September 30	Within PFA or within ½ mile of nest sites	Activities can occur: October 1- March 31	No management within 30 acre nest stands
Occupied raptor nest sites	Activities are prohibited: March 1 – July 31	Within 660 feet	Activities can occur: August 1- February 28	No management within 100 feet of nest tree

Big Game

- Horizontal hiding cover will be provided by retaining 3 to 5 acres non-thinned patches of forest trees as necessary throughout the project area and on relatively flat topography. It would be desirable to leave these clumps around existing snags for further protection.
- From December 1st to April 1st, management activities will be restricted within big game winter range (MA4a). Restricted management activities include all Forest Service and contracted activities, including but not limited to, such activities as timber harvest, precommercial thinning, fuel treatment, prescribed fire, and roadwork.
- This EA permits waiver or adjustments to seasonal restrictions if recommended by the District wildlife biologist and approved by the District Ranger. If a waiver is permitted, no more than 10% of the total area of winter range may be disturbed at any one time.
- In known calving/fawning areas, timber harvest, precommercial thinning and road work will be prohibited from May 1st to June 30th. For prescribed burning activities, burning crews will avoid known calving/fawning areas from May 1st to June 30.
- In areas not specifically identified for calving and fawning, burning crews will watch for lone elk or deer. If crews see lone animals, they will search the immediate area for calves and fawns and avoid igniting fire where young animals are discovered. Burning crews do not need to monitor elk and deer outside the May 1st to June 30th window.
- In treatment units, maintain security cover/hiding cover patch for big game by using the variable tree density strategy described in the Activity Descriptions section above. Untreated patches should provide higher levels of security/hiding cover in the short-term. Lower tree density areas will open up portions of forest

stands, permitting natural regeneration to occur; which in turn should provide cover patches in about 20 years.

Connectivity

- To conserve potential "late and old structure" (LOS) stand conditions in the project area and connectivity between such stands both within and adjacent to the project area, proposed thinning or burning in stands exhibiting LOS or connection-corridor potential would be specifically designed and controlled to enhance and accelerate the development of LOS values. There will be no net loss of LOS as the result of activities.
- In Forest Plan Amendment 2 connectivity corridors, manage canopy closure at the upper 1/3 of site potential. Retain 15% of the stands in the denser patches where available, in untreated patches ranging in size from 3 acres to 5 acres. Corridors must be at least 400 feet wide. This prescription will be applied to harvest and burning treatments.

Roads

- The project would not involve any construction of new permanent roads or other new permanent infrastructure.
- Temporary roads would be located outside of riparian habitat conservation areas (RHCAs)—areas near streams or other water—and rehabilitated and closed upon completion of treatments for which they are used.
- If any existing roads in the area that are currently grown over or closed by earth berms are used for fire lines or temporary access of workers or equipment, they would be rehabilitated and re-closed upon completion of treatments for which they are used.
- If a road was found to be in an undriveable condition prior to project activities it should be returned to an undriveable condition after project activities are completed.

Aspen

- Aspen stands in these areas are to be managed to protect or enhance riparian-dependent resources, in particular the reestablishment of remnant hardwood shrub and tree communities.

Protect Blue Grouse Winter Roosts

- To provide blue grouse winter roosts, retain large mistletoe infected or "wolfy" Douglas-fir trees, where available, along ridge tops and large scab openings.

Soils

Keep soil impacts as small as practical, especially long-lasting impacts; and keep detrimental soil impacts from this project to less than 20% of the area of each unit. These standards apply to biomass removal as well as commercial logging operations.

- No skidding will be allowed in the moist meadow in unit 100.
- For harvesting biomass with a feller buncher - skidder combination, design elements are the same as for large-tree harvest.
- For harvesting biomass with low ground pressure harvesters, forwarders, and other low ground pressure machinery, the following design elements apply:
  - The machinery shall have a maximum of 12.0 pounds/square inch.
  - Forwarder trails shall be spaced a minimum of 50 feet apart, center to center.
  - The machinery will be operated only on dry, snow covered, or frozen soil.
  - The machinery will be operated only on slopes of 35% or less, except for short distances.
- No heavy equipment shall be allowed on inclusions of highly erodible soil. 'Inclusions of highly erodible soil' generally means areas larger than 50 feet diameter, steeper than 30%, with less than 75% ground cover, but a soils specialist can approve exceptions (either stricter or less strict).
- Grapple piling shall be done with low ground pressure (< 8.5 psi) on dry, frozen, or snow covered soil, and machinery will stay on existing skid trails where possible. “Dry” means July through September, or obviously dry in the top 4 inches during other months. “Frozen” means frozen to a depth of 4 inches or more. “Snow covered” means sufficient snow strength and depth to prevent soil disturbance and compaction.
- Skid trail locations shall be designated and approved prior to logging. On areas where existing skid trails spaced 100-140 feet apart can be reused, reuse the old skid trails. Otherwise, space skid trails about 120 feet apart where practical, using existing skid trails where possible and appropriate.
- Draw bottoms are not appropriate for skidding. If the only way to log a particular part of a unit is to skid in the draw bottom, that part of the unit will be excluded from harvest.
- Avoid downhill skidding on slopes steeper than 35%, where feasible, using directional felling and tractor winching. There shall be no downhill skidding on slopes steeper than 45% for more than 40 feet.
- Avoid skidding uphill for more than 40 feet on slopes steeper than 25% for ash soils (units 10, 12, 24, 30(west side), 48, 72, 80, 84, 92, 96, 120, and all units in the southern part) and 35% for non-ash soils (units 2, 4, 22, 25, 28, 30(south side), 32, 33, 34, 36, 38, 40, 42, 44, 46, 112, 114, and 116).

- No skidding will be done under wet soil conditions, when ruts six inches or deeper would form on a continuous 50 feet or more of skid trails.
- Re-use existing landings where feasible and where they are away from shallow soil areas and ephemeral draws unless approved by the hydrologist, soil scientist or fisheries biologist.
- Skidders shall not be allowed off skid trails unless the soil is frozen or other conditions approved by a soil scientist. Directional felling and/or winching shall be used when necessary. Low ground-pressure equipment (<8.5 psi) can be allowed off of skid trails under, dry, frozen, or snow covered conditions.
- In harvest units where normal design elements are insufficient to comply with the Forest Plan soil standards, additional design elements will be prescribed so the standards are met, or the unit will be dropped from tractor harvest. "Additional design elements" could include logging only on dry soil, or subsoiling, or logging only on frozen or snow covered soil.
- Erosion from subsoiling skid trails or forwarder trails shall be controlled by subsoiling in a "J" pattern, by water bars, or by comparable measures. If runoff cannot be diverted out of the furrows (such as in draw bottoms), do not subsoil. Skid trails on slopes steeper than 28% should not be subsoiled. Do not subsoil sections of skid trails where excessive rock will be pulled to the surface.
- The purchaser shall subsoil and revegetate (by planting trees or seeding grass) all tractor and skyline landings except where soils are not suitable for subsoiling, such as on roads.
- Runoff and erosion from skid trails, skyline corridors, and tractor-winch furrows shall be controlled by the use of cross drains or comparable measures. Outfalls of the cross drains shall be clear and located on soil where water will infiltrate, not on shallow or impermeable soil. Cross drains on skid trails should be spaced appropriately for the terrain.
- Meet Forest Plan ground cover standards when conducting prescribed burning.
- Prescribed fire control lines shall not be built down draw bottoms.
- Piles to be burned shall consist of less than 3% of the surface area per acre treated, not counting landings.

Watershed

Protect fish bearing, perennial, and intermittent streams with PACFISH buffers.

- RHCAs for Category 1, 2 and 4 streams and for Category 3 and 4 wetlands shall be consistent with PACFISH. (100-300')
- Activities associated with removal, replacement, improvement or addition of culverts in RHCAs and ephemeral draws will be completed during dry conditions or after consultation with fish biologist and hydrologist or their designate. Cease all work if storm events occur and increase stream flows. During installation, efforts are taken to prevent the escapement of soil into streams.

Protect ephemeral draws/Reduce erosion- sediment transport

- Ephemeral draws will have site specific, no-cut buffers (10-50' on each side).
- Equipment will be permitted in ephemeral draw buffers only at designated crossings. If skidding across draw bottoms that show signs of water flow, skid only when the soil in the draw is dry or frozen, and place slash or other ground cover on the skidtrail after use with approval of aquatic specialist.
- Use erosion control measures (i.e., sediment filters, straw bales) to protect streams from road construction sediment, where needed
- Cross drains and other drainage structures should be spaced appropriately for the terrain
- For roadwork, operate machinery only on road prism.
- Temporary roads will be located outside of sediment delivery zones (as determined by soil type, ground vegetation, and slope), will meet Best Management Practices for controlling surface run-off and erosion, and will be hydrologically closed. Machinery used to build temporary roads shall remain within approved roadway.
- Avoid placing hand or grapple piles in RHCAs.

Reestablishment of natural drainage. Decompaction of travel way. Restoration of ground cover. Preventing access to decommissioned road. Prevent/reduce potential for erosion/sedimentation.

- Decommission/obliterate temporary roads by some combination of the following: recontouring slopes; subsoiling compacted soils to a depth of 16 inches (unless prevented by bedrock or rock content of soil);pulling berm; pulling slash (where available); planting or seeding disturbed areas to achieve a minimum of 35% ground cover; restoring natural drainage patterns (may include pulling waterbars) and waterbarring as needed; and /or disguising the first hundred yards of travel way with large pieces or organic material such as cull logs and tops of trees. Methods for individual roads will be determined in consultation with the District Hydrologist, Fisheries Biologist, or Soil Scientist.

Prevent petroleum products or other deleterious materials from entering stream systems.

- The Forest Service will require a Hazardous Substances Plan and a Prevention of Oil Spill Plan from contractor to be reviewed and approved prior to implementation of activities including prescribed fire.

Fisheries

- Maintain canopy structure within RHCAs so as to maintain or bring large wood (including site potential wood) density to >20 pieces per mile where the pieces are >12" in diameter and >35' in length to improve pool quality, pool quality, and floodplain connectivity.

- Maintain or improve canopy cover within RHCAs to improve spawning and rearing maximum stream temperatures and reduce stream temperature variation.
- Maintain or recover ground cover and soil permeability so that banks are naturally stable, wetted width/depth ratios are <10, and sediment delivery is not hampering the improvement of pool quality and quantity.
- For each 6th level watershed, limit total ground disturbance to an acceptable level with the objective of reducing sediment transport to the RHCAs (10-15% total disturbance).
- Limit all ground disturbing activities within the RHCAs and drainages to those actions that do not provide chronic sediment, ash, or other inputs to active floodplain/riparian areas in the years following treatment.
- No landings or new roads within RHCAs and no pile burning within active floodplain/riparian areas.
- Burn blocks within the RHCAs will be limited in size to assure overall burn severity remains low within each drainage and there are no adverse cumulative effects to the drainage or watershed. Each burn block will have a field review by the District Fuels specialist and appropriate resource specialists (hydrology, fisheries, and soil) before the implementation of the next burn within the drainage. Only one burn block within a RHCA will be burned at any given time within each drainage.

Heritage

Site Protection

- All NRHP eligible and potentially eligible (unevaluated) sites will be avoided/protected from any ground disturbing impacts during all timber harvest activities.
- There will be no hand or grapple piling within the boundaries of a NRHP eligible or potentially eligible (unevaluated) site.
- All NRHP eligible and potentially eligible (unevaluated) historic properties with structural remains or other wooden feature types, and/or can and bottle refuse areas will be avoided/protected during all burning activities. Eligible historic remains will be identified on the ground and proper protection measures will be conducted during the burning activities.
- Under the terms of the Management Strategy for the Treatment of Lithic Scatter Sites (Keyser et al. 1988), low intensity burning (<300° C.) will have no effect on the prehistoric lithic assemblages.
- If cultural resources are encountered during project implementation, all ground-disturbing activities will cease until the Archaeologist is contacted, assesses the situation, and recommends appropriate action.

Visual

Proposed activities should meet Visual Quality objectives along the Highway 26 corridor with the following design elements, to be applied in the foreground zones.

- Existing landings/created openings can be used for landings as long as size is restricted to removing no more than one additional row of trees. This will keep size of openings to less than ¼ of an acre.
- Landing slash should be cleaned up to where less than about 10 tons per acre of slash remains, using Photo Series for Quantifying Natural Forest Residues, description guide 3-PP-3 as a guide.
- Landings and skid roads within the foreground zone should be returned to their original/natural profile, with no continuous berms or soil piles left behind. This does not preclude the use of cross bars to reduce erosion on skid trails.
- All trees within the foreground zone visible from Highway 26, within about 200 feet, should be flush cut for stump height, with the cut face sloped away from the highway. Tree marking paint should not be visible from the highway, except for stump shots.
- Apply variable spacing prescriptions to thinned stands so that the result is natural appearing to the casual observer.
- Disposal of slash piles should take place within one year of piling.
- Protect the railroad interpretive area improvements during activities.

Range

Protect government and permittee investments

- All existing structural range improvements (fences, gates, spring developments, etc.) and permanent ecological plots will be contractually protected (ATPs).
- Protection of the structural range improvements must be maintained during burning operations, and proper repair to damaged improvements assured.
- If structural improvements are damaged during project operations they will be repaired to Forest Service standards prior to livestock scheduled use by the party responsible for causing the damage. Repairs will be required of purchaser if damage was done during timber sale operations, by thinning or fuel treatment contractors, or by force account where appropriate.
- Fence right of ways, trails, other developments and access to them will be cleared of slash produced by logging or post sale activities.

Reduce conflicts to grazing schedules

- Burning will be coordinated with Range Specialist and grazing permittee.

Botany

Avoid retarding recovery of native plants

- To protect Achnatherum species habitat, vehicles and off-road equipment should avoid scabland areas.
- To protect Botrychium species habitat and Carex interior habitat, off-road equipment should avoid seeps, springs, and riparian areas. Needs for temporary culverts were identified post 2007 field surveys. Monitoring of these specific sites will be needed spring 2008 prior to road reconstruction across stream crossings.
- To protect Phacelia minutissima habitat, areas supporting false hellebore (Veratrum californicum), should be avoided with vehicles and heavy equipment even if they dry out late in the season.
- To protect Carex idahoa habitat, prescribed burning should produce only low to moderate fire severity so rhizomes of any existing plants will survive and sprout after the burn.
- To avoid additional introduction of non-native species within the project area, local native seed mixes or non-persistent weed-free certified seed will be used for areas requiring erosion control or rehabilitation measures.

Noxious Weeds

Prevent the introduction, establishment and spread of invasive plants.

- To prevent (as much as possible) the introduction of the seeds of noxious weeds onto National Forest Land, contractors/purchasers shall ensure that all equipment moved onto Forest land is free of soil, seeds, and vegetative matter or other debris that could contain or hold seeds. The contractor/purchaser shall employ whatever cleaning methods are necessary and notify Forest Service prior to moving each piece of equipment onto National Forest land. Notification would include identifying the location of the equipment's most recent operations. Upon request of the Forest Service, arrangements would be made for inspection of each piece of equipment. Equipment includes all harvest machinery except for log trucks, chip vans, pickup trucks, or other vehicle used for daily transport, service vehicles, and water trucks.
- Schedule contract and FS work on the north side (which has limited weeds) and the south side (heavy infestations of knapweed, houndstongue, and toadflax) to reduce spread of noxious weeds. Machinery and off road vehicles may move from the north side to the south side, but if moving from the south to the north it must be washed first.
- Inspect active gravel pits, quarry sites, and borrow areas for invasive plants before use and transport. Require treatment of infested sources before any use of pit material. Use only gravel and rock that are judged to be weed free by USFS weed specialists. Conduct road blading, brushing and ditch cleaning in areas with high concentrations of invasive plants in consultation with District or

Forest-level invasive plant specialists, incorporate invasive plant prevention practices as appropriate.

- If contractors/purchasers desired to clean off-road equipment on National Forest land, such as at the end of a project or prior to moving to a new unit that is free of noxious weeds, contractor and Forest Service shall agree on locations of cleaning and control of off-site impacts, if any.
- Seeding will be done after ground disturbing activities in areas of known infestation to prevent new weed infestations.
- If a noxious weed is known to spread due to burning, they will be appropriately treated prior to prescribed burning. Direct burning through these areas will be avoided. Avoid ignition and burning in areas at high risk for weed establishment or spread due to fire effects.
- •Minimize soil disturbance to no more than needed to meet vegetation management objectives. Prevention practices to reduce soil disturbance include, but are not limited to:
  - Treating fuels in place instead of piling
  - Minimizing heat transfer to soil in burning
  - Minimizing fireline construction

Recreation

- Snowmobile trails are co-located (share the roadway) with proposed haul routes on the following roads: 2600087, 2600318, and 2600-306. Plowing and use of these roads for harvest activities during the winter recreational season, generally December 15th through April 15th (though timing varies with snow conditions), will be coordinated in advance with the forest recreation specialist and the local snowmobile club.

Fire, Fuels, and Air Quality Design Features

- Firelines needed to conduct the proposed treatments shall consist of natural breaks, existing roads, or hand-constructed lines. Hand-constructed firelines may be used to keep fire out of sensitive areas such as historic sites or private property.
- Private property will be avoided and protected from prescribed fire by isolating or separating it from areas to be treated. This may be accomplished by constructing firelines, planning ignitions to stop at effective control points such as roads or natural barriers, staging firefighters or firefighting equipment at strategic points, or other means.
- The Forest Service will take steps to notify adjacent landowners in advance of planned burn operations.

- As part of the plan for retention of logs and snags, protection measures shall be used during prescribed underburning to reduce consumption of these large woody fuels needed for wildlife habitat and hydrologic stability. Total consumption of large down wood shall be less than 3 inches of the circumference.
- In compliance with the Clean Air Act, burning of any kind will not occur unless prior approval is granted by the Oregon Department of Forestry.
- Burning shall be planned for times when the transport winds and mixing heights are sufficient to displace much of the smoke from the area. No burning will occur during the visibility-protection periods of July 1st – September 15th for Class 1 air sheds that may cause haziness and reduced visibility of the Strawberry Mountain Wilderness.
- Use biomass utilization as much as possible to reduce emissions from burning.

Silviculture

- To enhance structural diversity for wildlife and visuals while reducing fuel loadings, trees would be left at a varied spacing, as opposed to even spacing, with the density varying as much as 50% across the stands. Thin to lighter densities near the private lands and in the drier biophysical environments and at higher densities farther from the boundary and in the cooler and moister environments.
- Retain all snags that are not safety hazards. Future snag replacements will be created by the prescribed burning.
- Retain "wolfy" trees with stem damage, poor form, broken tops, numerous large branches, or other characteristics that make them unsuitable for commercial products are to be left for wildlife habitat, at an average of approximately one tree per acre, when available.

- In stands prescribed for commercial thinning to each listed average density, the following range of densities would be used:

Table 2-4 Variable Density Thinning Ranges

Percentage of Stand	40 ft2/acre Average	50 ft2/acre Average	60 ft2/acre Average	80 ft2/acre Average
10%	20 ft2/acre	25 ft2/acre	30 ft2/acre	40 ft2/acre
15%	30 ft2/acre	40 ft2/acre	45 ft2/acre	60 ft2/acre
50%	40 ft2/acre	50 ft2/acre	60 ft2/acre	80 ft2/acre
15%	50 ft2/acre	60 ft2/acre	75 ft2/acre	90 ft2/acre
10%	60 ft2/acre	80–100 ft2/acre	90–110 ft2/acre	100–120 ft2/acre

*Wildlife leave patches are to be taken out of the unit first, then the above percentages are to be applied to the portions of the unit that is actually thinned.

- Unthinned areas are to be left for wildlife habitat that are 3 to 5 acres in size and cover 5 to 15% of the area to be treated. In units immediately adjacent to the public/private boundary, retain unthinned patches at the 5% level.
- Openings up to ¼ acre in size are permissible in locations when suitable trees are scarce.
- The spacing of leave trees in precommercial thinning units would also be varied by as much as 50% to provide a variety of habitats and visual diversity. Unthinned areas are to be left for wildlife habitat that are 3 to 5 acres in size and cover 5 to 15% of the area to be treated. In units immediately adjacent to the public/private boundary, retain unthinned patches at the 5% level.
- Acceptable mortality ranges for prescribed burning are as follows:
  - Trees 0-1” dbh tree mortality from 30 to 70%.
  - Trees 1-5” dbh tree mortality from 5 to 15%.
  - Trees 5-10” dbh, tree mortality from 5 to 10%.
  - Trees 10-20”dbh, tree mortality from 1 to 5%.
  - Over 20”dbh tree mortality is not exceed 1 tree per acre.
- These mortality levels are based on averages over the whole burning areas and recognize the fact that fire is a relatively inexact tool and that there would be some localized areas where mortality reaches 100%. These patches should be kept to less than 2 acres and preferably no larger than the ¼ to ½ acre size that was thought to exist under historic conditions (Agee, 1993).

Safety

- State certified flaggers would control traffic in accordance with requirements by ODOT standards, during felling within 200 feet of the pavement on Highway 26. All compliance issues would be part of the contract with the contractor.
- During prescribed burning operations adjacent to the highway, hazard signes would be placed along highway and ODOT notified.

Monitoring

Vegetation Monitoring (Silviculturist)

Tree marking will be monitored to ensure compliance with the silvicultural prescription and marking guide. Monitoring will check for correct selection and designation of trees expected to live and snags to be left for wildlife habitat and resource protection.

After harvest, a post sale examination will be done to determine the actual need for precommercial thinning, fuel treatment, and reforestation. Plans will be adjusted to the actual post harvest conditions and need for further treatment.

All areas planned for tree planting will be examined prior to planting. Exams will assess levels of competing vegetation, pocket gopher and other animal activity, and other environmental conditions. Seedling species and stock type will be prescribed as well as site preparation, planting, and protection methods. Any changes from methods prescribed in this document will require additional NEPA analysis.

Planted and natural regeneration areas will be monitored for seedling survival, growth, and damaging agents. Stocking surveys will occur periodically until planting areas are certified adequately stocked and "free to grow". Deficient areas will be replanted to at least minimum stocking. Protection measures may be implemented to increase tree survival; this would require additional NEPA analysis.

Watershed and Fisheries (District Hydrologist and Fisheries Biologist)

Monitor Best Management Practices (BMPs): Three to five percent of tractor yarded units and smaller amounts of skyline and helicopter yarded units will be monitored to ensure BMP implementation and effectiveness. Monitoring would be done by the District hydrologist, fisheries biologist, soil scientist, or trained technicians, and the Sale Administrator and would occur during project implementation and after completion of the project.

Monitor Unit Boundaries along RHCAs: Monitor three to five percent of units adjacent to RHCAs to ensure adequate buffering of mechanized harvest/fuels reduction activities.

Fire and Fuels Monitoring (Fuels Specialist)

Monitoring of work conducted under thinning, grapple and handpiling contracts would consist of periodic inspections while work is in progress and after completion to determine compliance with contract standards.

Prescribed burning implementation monitoring includes burn day monitoring to ensure burning is conducted within the parameters stated in the Burn Plan. This monitoring is completed by fire personnel. Weather, flame length, and smoke dispersal would be a minimum of what is recorded. Fuel reduction will be monitored through fuels plots and would be conducted by fire personnel.

Prescribed burns are to be monitored during and after the burn for the amount of effective ground cover remaining after the burn, the amount of fuel reduction, and post burn mortality and crown scorch.

Burning in RHCAs will monitored for the amount of ground cover that is exposed and the mortality levels of riparian shrubs and trees.

Monitor Visual Quality (Landscape Specialist)

Upon completion of the proposed action layout, the design criteria above should be reviewed both on the ground and in relation to the written document.

Monitor Forage Recovery (Range Specialist)

Monitor vegetation recovery after prescribed burning to determine when grazing may resume. Rangeland conditions including forage production and species diversity will be monitored after burning to ensure the areas are ready to support livestock grazing on a sustainable level.

Monitor Noxious Weeds (Range Specialist)

Disturbed areas within the project area will be periodically monitored to identify the establishment of noxious weed species. New infestations will be included in the Forest weed database and will be treated using appropriate methods.

Comparison of Alternatives

This section normally includes a comparison of alternatives. HFRA does not require alternatives other than the Proposed Action if the project is within a WUI, however, a comparison between No Action and the Proposed Action is included below to summarize the effects by the purpose and need and analysis issues..

Issue Comparison	Measure	Existing Condition (No Action)	Proposed Action
Reduce Risk of Uncharacteristic Wildfire	Fire Type in 20 years	Active Crown Fire – 38% Passive Crown Fire – 32% Surface Fire – 30%	Active Crown Fire – 25% Passive Crown Fire – 16% Surface Fire –59%
	Change in Crown Fire Initiation Potential	Extreme – 7% Very High – 24% High – 27% Moderate – 42% Low – 0%	Extreme – 6% Very High – 19% High – 16% Moderate – 48% Low – 11%
	Surface Fuel Loadings in 20 Yr	Light – 38% Moderate – 21% Heavy – 41%	Light – 62% Moderate – 8% Heavy – 30%
Improve Forest Health	% Unhealthy Forest Treated	0%	47%
Treatment Priorities and Small Material Utilization	Acres of commercial harvest	0	1811
	Acres of pre-commercial thinning	0	1465 (includes acres within commercial thin units)
	Acres of potential biomass removal	0	605
Consider Social and Economic Implications	Value of commercial harvest (dollars)	0	$10,324
	Jobs from project activities	0	34
	Volume of economical viable timber harvest (cubic feet)	0	7336 CCF

Issue	Measure	Existing Condition (No Action)	Proposed Action
Adjacency of temporary road construction to the Dixie Mountain Inventoried Roadless Area .	Analysis of Impacts on Dixie Mountain Inventoried Roadless Area	No Impact	No Impact
Impact of Invasive Species and Noxious Weeds Effects on Soils	Risk of spread (Combined Activities)	No Impact	Potential risk of noxious weed establishment and spread,
	Comparison to Forest Plan soil standards (standard not to exceed 20%)	No Impacts	No units exceed 20% threshold
Effects of Roads on Wildlife, Fisheries, Invasive Species and Noxious Weed Spread.	Miles of road maintenance	0	44
	Temporary Culvert Installation	0	9 temporary culverts (5 on intermittent streams and 4 on ephemeral streams)
	Miles of road maintenance in RHCAs	0	6.2
Effects of Project on Aquatic Species	Effects to Aquatic Species	No Change to present rate of recovery	Due to opening of canopy and ground disturbance recovery will be slower but not of significance.
Effects to Wildlife Species by Changes to Road Density and Reducing Cover	Miles of Road Reconstruction	0	0
	Miles of temporary road construction	0	1.8
	Miles of Road within the Project Area (includes both open and closed roads)	63.3	63.3 (65.1 before temporary roads are decommissioned)
	Open road density pre and post project	2.68 miles of open road per square mile. Open road densities meet or exceed FP standards except for winter range (currently 2.4, FP standard is 2.2 mi/sq. mi)	2.52 miles of open road per square mile. Open road densities meet FP standards in summer range and winter range
	Miles of closed roads temporarily reopened for use and re-closed	0	30

Issue	Measure	Existing Condition (No Action)	Proposed Action
Effects to Wildlife Species of Converting Multi-story Stands To Single-Strata	Size and acres of untreated patches retained within proposed units	No Impact	Variable thinning densities ranging from 20 to 120 ft2/acre. Unthinned areas left for wildlife that are 3 to 5 acres in size and cover 5 to 15% of the area to be treated. Units immediately adjacent to the public/private boundary, retain unthinned patches at the 5 % level.
	Summary old growth analysis	Old growth remains the same, multi-storied and dense. Conditions favor canopy-dependent species such as pileated woodpecker and pine marten. High tree stocking and fuel loads make old growth stands subject to stand replacement fires.	Approximately 477 acres of OFMS converted to OFSS. Younger stands (about 2,700) are treated to accelerate old growth development in the future. Species that prefer open stand conditions, such as white-headed woodpecker would benefit.
	Acres of OFMS converted to OFSS	0	477
	Development of OFMS and OFSS in 50 years Warm Dry Forest Types Hot Dry Forest Types	OFMS 36% 1%	OFSS 7% 0%
Removal/ Development of Trees With Old Growth Characteristics	Qualitative discussion on old tree retention	No Impact	All live trees greater than 21" dbh would be retained. Thinning from below (majority of trees to be cut are in the smallest diameter sizes). Wolfy trees with stem damage, poor form, broken tops, numerous large branches to be retained on an average of one tree per acre, when available.
	Big Game - cover analysis (% cover) Marginal Cover Satisfactory Cover Total Cover	42% 19% 61%	24.6% 13.5% 38.1%
	Post treatment snags per acre: 10"-20" dbh 20"+ dbh	6.8 1.1	7.5 1.4

Issue	Measure	Existing Condition (No Action)	Proposed Action
Green Trees and Snags with Value To Wildlife	Snags in 50 years: 10"-20" dbh 20"+ dbh	 9.5 2.1	 7.5 2.3
	DecAID advisory tool results (tolerance levels)	1-50% | 1-50%	OFMS 22% 1% | OFSS 36% 0%
	Summary of wildlife snag analysis	In the short-term, maintains existing snag and down log levels. In the long-term snag levels are expected to increase due to insect, disease and wildlife	Harvest removes incidental levels of snags; prescribed fire increases snags. In the long-term, snags increase but not at the same rate as No Action. Most large trees would be available for snag recruitment in the future.
Activity Timing and Effects on Species	Wildlife analysis impact determination: Big Game	No Impact	Limited short term impact. No long term impact. In known calving/fawning area, precommercial thinning and underburning would be prohibited from May 1st to June 30tth December 1st to April 30th to minimize effects.
	Nesting Birds	No Impact	Limited short term impact. No long term impact. Burning and thinning treatments conducted in the spring can affect landbirds during the breeding season.
	Goshawks and other Raptors	No Impact	Limited short term impact. No long term impact. Management activities would be prohibited within ½ mile of the nest sites from April 1 to September 30 to avoid disturbing goshawks during the breeding season. Seasonal restrictions for nesting raptors would be applied in active territories for this project.
Potential Impacts to Soils	Est, acres of ground disturbing actions: Ground Skidding/Skyline Grapple Piling Temporary "Road Construction Potential Biomass Yarding	 0 0 0 0	 2143 493 1.8 605

CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS

Introduction

This chapter provides information concerning the affected environment of the Dads Creek Wildland Urban Interface project area, and potential consequences to that environment from the Proposed Action (Alternative 2) or the likely results of taking No Action (Alternative 1). All types of effects, including direct, indirect and cumulative effects, are disclosed. Effects are quantified where possible, or discussed qualitatively. The means by which potential adverse effects will be reduced are described (see also Chapter 2).

The discussions of resources and potential effects take advantage of existing information included in the Malheur National Forest Plan's FEIS, other project EA's or EIS's, project-specific resource reports and related information, and other sources as indicated. Where applicable, such information is briefly summarized and referenced to minimize duplication.

Specialist Reports, Use of "Best Available Science," and Project Record

This Environmental Assessment hereby incorporates by reference the Forest Vegetation, Fire and Fuels, Roads, Wildlife, Soil, Water, Fisheries, Scenery, Recreation, Range, Heritage, and Socio-Economics Specialist Reports in the Dads Creek Wildland Urban Interface Project Record (40 CFR 1502.21). The analysis also references the Forest Roads Analysis, Dads Project Roads Analysis, and Biological Evaluations for Wildlife, Fisheries, and Plant Species. These Specialist Reports and Biological Evaluations are located in each specialist's section of the Project Record and contain the detailed data, methodologies, analyses, conclusions, maps, references, and technical documentation that the resource specialists relied upon to reach the conclusions in this environmental assessment.

Best available science is considered in preparation of this EA. The concept of "best available science" is also a matter of opinion to some degree since scientists can legitimately disagree about the meaning or significance of individual study results. As a general matter, we show consideration of the best available science when we insure scientific integrity of the discussions and analyses in the project NEPA document. Specifically, this EIS and the accompanying project record identifies methods used, references reliable scientific sources, discusses responsible opposing views, scientific uncertainty, and risk (See 40 CFR, 1502.9(b), 150022.22, 1502.24).

The Project Record for the Dads Creek Wildland Urban Interface Project includes all project-specific information, including resource reports, the watershed analysis, and other results of field investigations. The record also contains information resulting from public involvement efforts. The planning record is located at the Blue Mountain Ranger District Office in John Day, Oregon, and is available for review during regular business hours.

Analyzing Effects

Direct, Indirect and Cumulative Effects

Direct environmental effects are those occurring at the same time and place as the initial cause or action. Indirect effects are those that occur later in time or are spatially removed from the activity.

Cumulative effects are those effects that result from the incremental impact of the action when added to other past, present or reasonably foreseeable future actions regardless of the agency or person that undertakes such other actions (40 CFR 1508.7). Cumulative effects can result from individually minor, but collectively significant actions taking place over a period of time. These "related actions" may be influencing current conditions. If so, their current (or foreseeable) effects are relevant to considerations of whether the proposed action would add to their effects.

In the descriptions of cumulative effects of the proposed action, relevant related actions that are known are identified and discussed. (A full listing of relevant related actions is provided in Appendix C.) Each cumulative effects analysis, for each environmental component, is guided by and consistent with the Council on Environmental Quality letter, "Guidance on the Consideration of Past Actions in Cumulative Effects Analysis" of June 24, 2005.

Irreversible and Irretrievable Commitments

NEPA regulations also state that the Forest Service must show any irreversible or irretrievable commitments of resources that may result from the alternatives. An irreversible commitment is a permanent resource loss including the loss of future options. It usually applies to nonrenewable resources, such as minerals or cultural resources, or to factors that are renewable only over long periods, such as soil productivity. Such commitments are considered irreversible because the resource has deteriorated to the point that renewal can occur only over a long period of time, at a great expense or because the resource has been permanently destroyed or removed. An irretrievable commitment is the loss of use or production of a natural resource for some time. One example is when suitable timberland being used for a winter sport site.

Timber growth on the land is irretrievably lost during the time the land is used as the winter sport site, however, if the use changed, timber growth could be resumed. The growth lost is irretrievable, but the timber resource is not irreversibly lost because the land could grow trees again in the future.

Forest Plan Consistency

The proposed action is consistent with the Malheur National Forest Land and Resource Management Plan (Forest Plan - USDA Forest Service 1990) and its amendments. Applicable forest-wide and land use designation standards and guidelines have been incorporated. The Forest Service uses design measures in the planning and implementation of land management activities. The application of these measures begins during the planning and design phases of a project.

Plans of Other Agencies

The CEQ regulation implementing NEPA requires a determination of possible conflicts between the proposed action and the objectives of Federal, State, and Local land use plans, policies, and controls for the area. The major land use regulation of concern is the Oregon Smoke Management Plan. See the "Findings and Disclosures" section at the end of this chapter for a discussion of compliance with this and other laws.

Existing Conditions and Analysis of Effects

The following sections contain information on the existing condition of individual resources and the reasonably likely outcome of taking No Action - Alternative 1 at this time. The effects (direct, indirect, and cumulative) of the Proposed Action - Alternative 2 on those resources and reasonably likely outcome of project implementation are also disclosed. More detailed discussions on methodology, analytical arguments, and further scientific discussions are contained within the various specialists' reports in the project files. These are available upon request.

Analysis of effects considers the cumulative effects of future maintenance burning since we are managing a wildland-urban interface and we desire to continue maintaining the reduced risk to homes and other property that this project is designed to provide . Prescribed burning is one of the best tools to maintain the forest in a healthy and fire safe condition and is a general goal of forest management throughout the Blue Mountains.

The INFORMS modeling incorporated the 2,500 acres of burning that is included in the Proposed Action for the next ten years, but did not incorporate any future burning nor any future mechanical treatments. This is because the model is only to be used as a comparative tool between alternatives of various treatments and is not intended to accurately predict the end results at specific times. Since the timing and location of future activities would be speculative, they are not included in the INFORMS modeling.

Fuels

Introduction

This project is identified in the Grant County Community Fire Protection Plan (GCCFPP) as a priority project. The GCCFPP is the result of a county wide effort initiated to reduce forest fire risk to citizens, the environment, and quality of life within Grant County. Citizens, fire districts, county staff or elected officials, and agency representatives have worked together to create a plan that would be successful in implementing fuels reduction projects, fire prevention education campaigns, and other fire-related programs. The objective, as stated in the Plan, is to enhance fire suppression capabilities by modifying fire behavior and providing a safe and effective area for fire suppression activities.

A general principal goal of fuel-reduction treatments is to reduce fireline intensities, reduce the potential for crown fires, improve opportunities for successful fire suppression, and improve the ability of forest stands to survive wildfire (Peterson et al.). To accomplish fuel reduction, canopy, ladder, and surface fuels can be manipulated in several different ways to affect their size, arrangement, density, and loading to then affect fire behavior. This section of the EA summarizes the existing fuel conditions and the effects of treating and not treating crown or canopy fuels, ladder fuels, and surface fuels.

Definition of Terms

Active crown fire – Continuous crown fire that burns the entire canopy fuel complex but depends on heat from surface fuel combustion for continued spread.

Canopy base height – The lowest height above the ground at which there is a sufficient amount of canopy fuel to propagate fire vertically into the canopy.

Canopy bulk density – The mass of available canopy fuel per unit of canopy volume. It is stand characteristic as opposed to a tree characteristic.

Condition Class – (fire regime condition class) a classification of the amount of departure from the natural regime. There are three condition classes for each fire regime. The classification is based on a relative measure describing the degree of departure from the historical natural fire regime. This departure results in changes to one (or more) of the following ecological components: vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated disturbances (e.g. insect and diseased mortality, grazing, and drought) (Hann et al. 2003).

Crowning Index – an indicator of crown fire hazard, it is the 20-foot wind speed needed to support an active or running crown fire dependent on canopy bulk density, slope steepness, and surface fuel moisture content. As a stand becomes denser, active crowning occurs at lower wind speeds, so crown fire hazard is greater at lower index values. The crowning index from the Forest Vegetation Simulator (FVS) (see Analysis Methods) is used to create a crown code in INFORMS.

Fire regime – A natural fire regime is a general classification of the role fire would play across a landscape in the absence of modern human intervention, but including the influence of aboriginal burning (Agee 1993). Coarse scale definitions for natural (historical) fire regimes have been developed and interpreted for fire and fuels management. The five natural (historical) fire regimes are classified based on average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on the dominant overstory vegetation (Hann et al. 2003).

Fire risk – The chance of a fire starting from any ignition source, determined by using the frequency of past fire starts.

Fire hazard – The potential magnitude of fire behavior and effects as a function of fuel conditions for any particular forest stand or landscape.

Torching Index – an indicator of crown fire hazard, it is the 20-foot wind speed in miles per hour at which a surface fire is expected to ignite the crown layer dependent on surface fuels, surface fuel moisture, canopy base height, slope steepness, and wind reduction by the canopy. As surface fire intensity increases (with increasing fuel loads, drier fuels, or steeper slopes), or canopy base height decreases, it takes less wind to cause a surface fire to become a crown fire.

Passive Crown Fire – Fire that kills individual trees or small groups of trees (torching).

Surface Fire – Fire that remains on the ground surface.

Regulatory Framework

Malheur Forest Management Plan and the Malheur National Forest Fire Management Plan

The Malheur National Forest Land and Resource Management Plan (Forest Plan), (USDA 1990) includes Forest-wide fire management direction consistent with other resource goals. The goals for fire management are to: 1) initiate initial management action that provides for the most reasonable probability of minimizing fire suppression costs and resource damage, consistent with probable fire behavior, resource impacts, safety, and smoke management and 2) identify, develop, and maintain fuel profiles that contribute to the most cost-efficient fire protection program consistent with management direction (Forest Plan IV-4).

The Malheur National Forest Fire Management Plan (FMP), (USDA 2007) is an annually updated operational guide that defines how the Fire Management Program will be implemented on the Malheur National Forest. Additional Forest wide fire management direction is in the Fuels Specialist Report located in the project record.

The suppression activities in these areas will primarily be full control. In the visual corridors the method used to suppress wildland fires should have the least impact on vegetation and soils possible. Apply "Minimum Impact Suppression Tactics" to the extent possible.

Healthy Forest Restoration Act

The Healthy Forest Restoration Act (HFRA) of 2003 is designed to expedite hazardous-fuel reduction and forest-restoration projects on specific types of Federal land that are at risk of wildland fire or insect and disease epidemics. All proposed HFRA actions must be consistent with the applicable resource management plans and they must be on lands managed by the USDA Forest Service or DOI BLM. For a project to meet the requirements of HFRA, the actions must occur in one of four areas. The area where this project is proposed is within a Wildland Urban Interface.

Grant County Community Fire Protection Plan

The Grant County Community Fire Protection Plan (GCCFPP) was developed by County citizens, fire districts, county staff or elected officials and agency representatives. The GCCFPP's mission is to reduce the risk of forest fire to life, property, and natural resources in the County. Most of the project area is within the GCCFPP defined Prairie City Rural WUI boundary and included in the GCCFPP Action Plan. The management objective as stated in the GCCFPP is to enhance fire suppression capabilities by modifying fire behavior inside the zone and providing a safe and effective area for fire suppression activities.

The GCCFPP's assessment for this project area determined that Risk Factor 1: Fire Behavior Potential was a 2 indicating there are moderate slopes, broken moderate fuels, and some ladder fuels. The composition of the surrounding fuels is conducive to torching and spotting. These conditions may lead to moderate fire fighting effectiveness. Risk Factor 2: Values at Risk was a 2 indicating an intermix or occluded setting, with a scattered areas of high-density homes, summer homes, camps, or campgrounds that are less than a mile apart. Risk Factor 3: Infrastructure was a 2 indicating limited access routes, moderate grades, limited water supply, and limited fire fighting capability in an area surrounded by scattered fire conducive landscape.

The Clean Air Act

The Clean Air Act (as amended in 1990) establishes certain minimum requirements which must be met nationwide, but states may be able to establish additional requirements. Users of prescribed fire must comply with all applicable federal, state and local air quality regulations. The Clean Air Act establishes major air quality goals, and provides means and measures to attain those goals by addressing existing and potential air pollution problems. The major air quality goals include attaining National Ambient Air Quality Standards (NAAQS), preventing significant deterioration of air quality in areas cleaner than the NAAQS

Analysis Methods

The INtegrated FOrest Resource Management System (INFORMS) software program was used for project analysis. INFORMS was designed for project level analysis and provides an interface to a variety of analysis tools such as the Most Similar Neighbor (MSN), Forest Vegetation Simulator (FVS), and the Fuels and Fire Extension for FVS (FFE-FVS). More information on this software and the analysis methods for the fire and fuels analysis can be found in the Fuels Specialist report. Prescribed burning is applied only once and in the first decade in the INFORMS model. Maintenance burning was not modeled during this analysis.

Existing Condition

Weather and Topography

The drainages flowing from the Dads project area generally flow to the southwest towards the Upper John Day River valley. Aspects range from southerly to northerly along the drainages. Moderate slopes exist throughout the sub-watershed, with slopes generally less than 40% except in the drainages and in areas to the north, closer to Dixie Butte. Elevation ranges from 6800 feet at the northeast end of the project to 4400 feet where Dads creek leaves the project area. Using data from the closest Remote Automated Weather Stations (RAWS), which are at Fall Mountain lookout and Yellow Pine, past weather data can be summarized. This data was used to calculate the 90th percentile weather for fire behavior calculations. During the normal fire season, temperatures can exceed 76 degrees and relative humidity can drop below 13% at the 90th percentile. Winds in this area are generally out of the west to southwest and exceed 10 mph. Average precipitation is 24-30 inches per year, mostly in the form of snow. Dry lightning storms are common during the summer months.

Suppression/Protection

Oregon State Highway 26 passes through the middle of the project area. Highway 26 is listed in the Grant County Community Wildfire Protection Plan as a safety corridor were the management objective is to enhance fire suppression capabilities by modifying fire behavior inside the corridor and providing a safe and effective area for fire suppression activities. Many structures exist on the private property adjacent to the project area. The Dixie rope tow cabin and a private residence are just to the east of the project, along highway 26. Along the west edge of the project, there are several structures including many private residences and the Fireside Lodge. Dixie Lookout is 1 ½ miles to the North of the project area.

Wildland fire threatens structures in three ways: direct exposure from flames, radiated heat, and airborne firebrands. The proposed treatments are meant to decrease the probability of wildland fire threatening structures in the immediate area of the project from all three means. Creating “defensible space” implies that the vegetation in the area between a structure and an oncoming wildland fire has been modified to reduce the wildland fire threat and to provide an opportunity for firefighters to effectively and safely defend the structure. Fuels can be treated in a relatively small area immediately adjacent to structures to reduce exposure to flames and radiant heat. Evidence suggests that fuel reduction within 40 meters of a structure can substantially reduce ignitions from direct exposure to flames or their radiant heat (Cohen 2000). Although Cohen’s research advocates that the fuel profile only needs treatment within 40 meters of residences, it is reasonable to assume that fuels reduction and thinning outside of this perimeter will decrease fire intensity, thereby increasing the ability of firefighters to protect life and property.

Structures at risk in the project area are on private land, adjacent to National Forest land. Many landowners have already treated their property, and some are currently in the process of creating defensible space. Reducing the fuel loadings, fuel continuity, and the availability of ladder fuels keeps fire confined to the ground, reduces fire intensity, and reduces firebrands, all of which increase the ability to control fires. Reducing the threat of ignition from firebrands requires reducing fuels both near and at some distance from the structure. Ignitions may result from firebrands originating as far away as 1 kilometer or more (Cohen 2000). Threat from firebrands, however, becomes greater the closer the fire moves to structures.

Adjacent to the northwest portion of the project area is the Dixie Wildlife Emphasis Area. While the area is primarily in the warm dry biophysical environment with a historically frequent fire return interval, there has not been any documented fires greater than 10 acres since aggressive fires suppression started. The 6,895 acre area is un-roaded and has not received any past fuels treatments to reduce fire hazard. The combination of these factors leaves the area at risk for a high severity fire in the future. A large fire in this area is likely, due to topography, to move into the Dads Creek project area.

Only one large fire has been documented within the Dads sub-watershed in recent history (last 30 years). This fire occurred in 1997 and started on private land at the southern end of the project. The fire burned a total of 161 acres of which only 10 acres burned on federal land. This fire was stopped at a road on the National Forest in an area that had been treated for conversion back to seral species.

Fire Risk

Fire risk is defined as the potential and frequency for wildfire ignitions. Fire risk is often defined as the number of fires per 1,000 acres per decade. Areas that have a fire start every one to ten years are considered to have a high fire risk. The Dads project area has a high fire risk based on past starts. The majority of fire starts for this area are from lightning.

Fire Hazard

Fire hazard for any particular forest stand or landscape is the potential magnitude of fire behavior and effects as a function of fuel conditions (Peterson et al. 2005). Fire hazard most commonly refers to the difficulty of controlling potential wildfire. Fire behavior characteristics such as rate-of-spread, intensity, torching, crowning, spotting, fire persistence, or resistance to control are generally used to determine and describe fire hazard. As Brown et al (2003) indicated, fire severity can be considered an element of fire hazard. Fire hazard must be reduced in order to protect life and property.

Large wildfire events burn quickly across the landscape and can consume hundreds to even thousands of acres in a single day. During extreme weather events, downhill fire runs of up to 5 miles during one burning period are not uncommon on the Malheur National Forest. Suppression resources contain over 95% of fires to less than 10 acres. Those fires that escape initial containment usually are ignitions that occur when fuel moistures and atmospheric conditions allow for extreme fire behavior, fires are in areas of high contiguous fuel loads, fires are not quickly or easily accessible, fires are in areas that don't allow suppression resources to safely work in close proximity to the fire (no escape route and/or safely zone), or a combination of the above.

Escape routes and safety zones are critical for firefighter safety allowing for suppression efforts that protect life and property. An escape route is an easily negotiated path to a safe area or safety zone where the fire would not post a threat to firefighters. In frequent fire regimes where fuels are light, fire burns quickly leaving behind a blackened area. Without the presence of other hazards, this area can provide an accessible safety zone for firefighters working directly on the fires edge.

Fire behavior and severity depend on the properties of the various fuel strata and the continuity of those fuel strata. The fire hazard can be characterized by the potential for fuels to cause specific types of behavior and effects. Fuel beds can be classified into 6 strata (Graham et al. 2004):

- tree canopy
- shrubs/small trees
- low vegetation,
- woody fuels
- moss, lichens, and litter
- ground fuels (duff)

The influences of fine fuels such as litter, duff, grasses and small woody fuels (less than 3 inches diameter) have the most affect on spread rate and intensity of fires. These fuels are used in fire behavior models developed for predicting the fire behavior of the initiating fire (Rothermel 1983). Coarse Woody Debris (>3 inches) have little influence on spread and intensity of the initiating fire; however, they can contribute to development of large fires and high fire severity. Fire persistence, resistance-to-control, and burnout time (affects to fire fighter and public safety, soil heating and tree mortality) are significantly influenced by loading, size, and decay state of large woody fuel. Torching, crowning, and spotting contribute to large fire growth and are greater where large woody fuels have accumulated under a forest canopy. Large woody fuel, especially containing large decayed pieces, are a suitable fuelbed for firebrands and can hold smoldering fire for extended periods of time (Brown et al 2003). Spot fires can also be started in rot pockets of standing snags. The distance firebrands travel is dependent of size of the firebrand, wind speed, and height above ground of the source.

Crown fires are generally considered the primary threat to life, property, and ecological and human values. Crown fires occur when surface fires create enough energy to preheat and combust fuels well above the surface (Agee et al 2002). Crown fires pose the greatest threat to fire fighter safety from increased fire line intensities and long distance spotting. These risks force the fire fighter to an indirect suppression strategy, which increases acres burned and thus increases fire severity on the landscape.

Existing fuel conditions are a result of effective fire suppression for the past 75 to 100 years, timber harvest, and livestock grazing. There has been an increase in understory vegetation and surface fuels, a change in species composition, and an increase in the continuity of vertical and horizontal stand structure. As a result, the potential for crown fire has increased. Historic stand structure played an important role in maintaining fire-dependent forest types, such as ponderosa pine (Graham, et al, 2004). Throughout much of the lower elevation grassland, woodland, and forest, grasses are one of the primary fine fuels that allow fire to spread. Livestock grazing has had an effect on the availability of these fuels since European settlement began (around 1850).

Surface Fuels

Fuel models (FM), are used to help describe and quantify surface fuel situations and estimate fire behavior. Criteria for choosing a fuel model involve assessing the fuel strata that will support the fire as it spreads and generates heat intensity. Where fuel beds are fairly continuous with similar fuel characteristics, one model can provide a realistic representation of expected fire behavior. A brief description of the FM characteristics that are located in the project area and their representation follows:

FM 2 includes open shrub lands and ponderosa pine stands. Grasslands being encroached by conifers, as well as light understory development is typical. These stands may include clumps of fuels or small concentrations of dead down material that could generate higher intensity fire and may produce firebrands. Fire spread is primarily through the fine curing grass, dead herbaceous fuels, and litter. Grazing can reduce grasses, decreasing the potential fire spread where grass is the primary carrier.

FM 8 represents a closed canopy of short-needle conifers with a compact surface-fuel litter layer. Representative vegetation types are mixed conifers of lodgepole, Douglas fir, subalpine fir, white fir, and larch. The surface-fuel layer is mainly needles and occasional twigs with very little undergrowth. Fires are typically slow burning with low flame lengths. An occasional heavy fuel concentration may cause a flare up, but the chance of any erratic fire behavior is small. Only under severe weather conditions with high temperatures, extremely low relative humidity, and high wind speeds does this fuel bed pose a high fire hazard.

FM 9 areas have mature stands with small amounts of understory development. Fires spread through surface litter that has accumulated under more dense stands of ponderosa pine. Concentrations of dead-down woody material will contribute to possible torching of overstory trees.

FM 10 represents an area in which there is a moderate loading of larger size fuel at the surface layer. In this model, fires burn in the surface and ground fuels with greater fire intensity than the other fuel models. The fuel bed contains a moderate loading of large size fuels from insect/disease, wind damage, or natural mortality. High heat intensity, torching, spotting, and crowning may be expected during wildfire events; resistance to control is high.

FM11 is similar to FM 10 in that the primary fire carrier is larger woody debris but it has heavier loadings than FM10. High heat intensity, torching, spotting, and crowning may be expected during wildfire events and resistance to control is high.

Surface fuels vary widely across the project area. An inventory of surface fuels was completed in the summer of 2007. The photo series method was used. Photo Series for Quantifying Natural Forest Residues in Common Vegetation Types of the Pacific Northwest (GTR-PNW-105) was used for this inventory. A majority of the project area has acceptable surface fuel loads currently due to past management. Within the past 20 years, 2,064 acres have been treated with harvest and fuel treatments, including underburning.

Most stands (72%) have light surface fuel loads of approximately 2-8 tons per acre. These areas are best represented with photo 2-PP-3. Fuel models 2, 8 or 9 are best to model fire behavior in these areas depending on whether grass or woody debris is the carrier of fire.

The moderate concentrations of surface fuels found in some stands (18%), is from insect induced mortality and past harvest activities. Fuel loads in these stands are approximately 8-15 tons per acre. Photo 4-PP-3 is the photo used to represent these moderate fuel areas and fuel model 10 is the best model for fire behavior predictions.

Areas with heavy fuel loads (10%) are best represented with photo (8-PP-3) and the most accurate fire behavior predictions are gained by using fuel models 10 or 11. Fuel loads in these stands can be as high as 30 tons per acre.

Duff levels over much of the project area range from .25” to 1” in depth. The exception is directly under the larger ponderosa pine trees. Bark from ponderosa pine constantly flakes off and accumulates within the first few feet of the bole of the tree. With the exclusion of fire over the past century these bark flakes have reached depths of up to 12” under much of the larger ponderosa pine. When these duff mounds burn completely, under low moisture conditions, high stress can be placed on the tree.

Table F-1 Existing Fuel Loadings and Percent of Area

Size Class	Loading for Areas With Light Fuel Loads (72%) (Approximate)	Loading for Areas With Moderate Fuel Loads (18%) (Approximate)	Loading for Areas With Heavy Fuel Loads (10%) (Approximate)
0”- 0.25”	0.03 Tons per Acre	0.1Tons per Acre	0.04 Tons per Acre
0.26” – 1”	0.9 Tons per Acre	1.6 Tons per Acre	2.5 Tons per Acre
1.1” – 3”	2.0 Tons per Acre	4.2 Tons per Acre	6.9 Tons per Acre
3” +	3.5 Tons per Acre	9.7 Tons per Acre	20.1 Tons per Acre
Total	6.43 Tons per Acre	15.6 Tons per Acre	29.54 Tons per Acre

Bark beetle populations in the project area are high as they are throughout the Blue Mountains. Ponderosa pine mortality is evident in all sizes of trees, with one or several beetle species responsible for causing mortality. Trees stressed from overstocking and droughty conditions are susceptible to attack. The pockets of mortality are contributing to increased fuel levels in the project area.

Ladder and Crown Fuels

Crown fires are generally considered the primary threat to life, property, ecological and human values. Crown fires occur when surface fires create enough energy to preheat and combust fuels well above the surface (Agee et al, 2002). Crown fires are typically faster moving than surface fires, more difficult to suppress, and pose the greatest threat to fire fighter safety from increased fire line intensities and long distance spotting. These risks force an indirect suppression strategy, which increases acres burned, and thus increases fire severity on the landscape result in more tree mortality, and smoke production. Crown fires are generally classified two ways:

- Passive crown fire occurs when single trees or small groups of trees torch. After the trees torch the fire returns to the surface.
- Active crown fire occurs when the fire moves through the crowns of adjacent tightly spaced trees until it reaches a more open stand or there are changes in topography or winds.

Both types of crown fire are dependent on the surface and ladder fuels for their initiation. The continuity and density of tree canopies in combination with wind and physical setting provide conditions required for rapidly moving crown fire. Canopy base height, canopy bulk density, and canopy continuity are key characteristics of forest structure that affect the initiation and propagation of crown fire. Reducing canopy bulk density by thinning is a means to minimize crown fire hazard. As surface fire intensity increases, or canopy base height decreases, it takes less wind to cause a surface fire to become a crown fire. As a stand becomes dense, active crowning occurs at lower wind speeds and the stand is more vulnerable to crown fire (Reinhardt, et al, 2003).

As stated above, canopy bulk density and crown base height are factors contributing to crown fire. The weighted average canopy base height (the lowest height above the ground at which there is a sufficient amount of canopy fuel to propagate fire vertically into the canopy) within the project area is 8 ft. The weighted average crown bulk density (the mass of available stand canopy fuel per unit of canopy volume) is .10 kg/m3. Stands with this canopy bulk density or higher can burn as an active crown fire.

Through past harvest activities and the effects of fire exclusion, stand structure over much of the project area has moved from primarily single storied stands with large trees to overstocked stands with multiple stories of mid size and small trees. Higher proportions of less fire dependent tree species are occurring such as white fir and Douglas fir. These species exhibit very dense crowns and grow in tighter spacing than the more fire dependent ponderosa pine and western larch. Canopy base height is low enough and canopy bulk density is high enough in many forested stands that with current surface fuel conditions, there is potential for passive crown fire on 27% of the area and active crown fire on approximately 31% of the area. Much of the larger ponderosa pine and western larch in the project area have smaller grand fir and Douglas fir growing as ladder fuels underneath. Stands that received stand conversion to seral species treatments in the past our now, susceptible to crown fire from overstocking of planted or naturally regenerated trees. Many stands in the southern half of the project area are in a condition that through past thinning and underburning can now be maintained with prescribed fire.

Crown Fire Initiation Potential

Currently, 58% of the project area has a high or greater potential for crown fire based on surface fuels, canopy bulk density, canopy base height, slope steepness, surface fuel moisture, and wind reduction by the canopy as described previously. Approximately, 42% of the project area has a moderate crown fire initiation potential with none of the area classed as low, which is far from the desired condition of mostly low with some areas of medium depending on where in the natural fire cycle the area is (see Map 7 in Appendix B).

Table F-2 Existing Condition Crown Fire Initiation Potential

Crown Fire Initiation Potential	% of project area
Extreme	7%
Very-High	24%
High	27%
Medium	42%
Low	0%

In this fire regime 1 dominated project area, an uncharacteristic high intensity fire can be expected with passive or active crown fires and long range spotting. Flame lengths will exceed capability for suppression forces to use a direct attack strategy. Fire severity is expected to be high with damage to soils and mortality in all size classes of trees.

Table F-3 Existing Condition Fire Type

Fire Type	% of project area
Active Crown Fire	31%
Passive Crown Fire	27%
Surface Fire	42%

Fire Regime Condition Class

A natural fire regime is a general classification of the role fire would play across a landscape in the absence of modern human intervention, but including the influence of aboriginal burning (Agee 1993). Coarse scale definitions for natural (historical) fire regimes have been developed and interpreted for fire and fuels management. The five natural (historical) fire regimes are classified based on average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on the dominant overstory vegetation (Hann et al. 2003). The five regimes include:

- I – 0-35 year frequency and low (surface fires most common) to mixed severity (less than 75% of the dominant overstory vegetation replaced);
- II – 0-35 year frequency and high (stand replacement) severity (greater than 75% of the dominant overstory vegetation replaced);
- III – 35-100+ year frequency and mixed severity (less than 75% of the dominant overstory vegetation replaced);
- IV – 35-100+ year frequency and high (stand replacement) severity (greater than 75% of the dominant overstory vegetation replaced);
- V – 200+ year frequency and high (stand replacement) severity.

A study completed by Emily Heyerdahl in the Blue Mountains of Eastern Oregon, found the historic fire return interval to be approximately 12 years in dry forest types similar to the ones found in the Dads creek project. Frequent lightning and tribal burning contributed to these frequent fires. The frequency of wildfires changed drastically in the late 1800's. The change to low frequency fire return intervals may be due to a dramatic increase in sheep and cattle grazing during the 1870's and 1880's, which significantly reduced the fine fuels. (Heyerdahl and Agee, 1996). Other factors that reduced the overall frequency of wildfire on the landscape are fire suppression improvements and increased access as more roads were constructed.

A separate study was completed by Diana Olson in 2000 to assess fire history and return intervals within riparian habitats. Using the same fire history data from Heyerdahl's study along with sample plots within riparian areas, Diana found similar fire return intervals within the riparian areas as that found in the upland forested areas. (Olson, 2000) These frequent fires burned with low severity. She concluded that keeping fire out of the riparian ecosystem will continue to alter structure and vegetation composition.

Fire regimes have been identified for all plant associations occurring across the Blue Mountains. In addition, fire frequency with the percent of any fire that may be mixed severity or stand replacing has been identified for all plant associations in the Blue Mountains. Within the project area, approximately 84% has been identified as plant associations within the warm dry plant association group and in Fire Regime 1 with an average fire frequency of 12-20 years and 24% of any fire potentially being stand replacing. Approximately 3% of the area has been identified as plant associations within the hot dry plant association group and in Fire Regime 1, with an average fire frequency of 15 years and 10% of any fire potentially being stand replacing.

12% of the project area has been identified as a plant association of cool moist having an average fire return interval of 59 years with 30% of any fire being stand replacing. These areas fall into a Fire Regime III and are dominated with lodgepole pine.

A fire regime condition class (FRCC) is a classification of the amount of departure from the natural regime. Coarse-scale FRCC classes have been defined and mapped . They include three condition classes for each fire regime. The classification is based on a relative measure describing the degree of departure from the historical natural fire regime. This departure results in changes to one (or more) of the following ecological components: vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated disturbances (e.g. insect and diseased mortality, grazing, and drought). All wildland vegetation and fuel conditions or wildland fire situations fit within one of the three classes. The three classes are based on low (FRCC 1), moderate (FRCC 2), and high (FRCC 3) departure from the central tendency of the natural (historic) regime. The central tendency is a composite estimate of vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated natural disturbances. Low departure is considered to be within the natural (historic) range of variability, while moderate and high departures are outside (Hann et al 2003).

Characteristic vegetation and fuel conditions are considered to be those that occurred within the natural (historic) fire regime. Uncharacteristic conditions are considered to be those that did not occur within the natural (historic) fire regime, such as invasive species (e.g. weeds, insects, and diseases), “high graded” forest composition and structure (e.g. large trees removed in a frequent surface fire regime), or repeated annual grazing that maintains grassy fuels across relatively large areas at levels that will not carry a surface fire.

Determination of amount of departure is based on comparison of a composite measure of fire regime attributes (vegetation characteristics; fuel composition; fire frequency, severity and pattern) to the central tendency of the natural (historical) fire regime. The amount of departure is then classified to determine the fire regime condition class.

A fire under current conditions would not burn as a low severity surface fire. Fires would be mixed severity to stand replacing with detrimental effects to other resources that did not historically occur. Another ecological component that has changed and is contributing to the departure from the natural fire regime includes the vegetation condition. Tree densities are much higher, and species composition has shifted to have a higher proportion of shade tolerant, fire susceptible fir. Insect and disease are contributing to tree mortality in the area that then contributes to surface fuel loading as trees fall to the ground.

At the landscape scale, the appropriate scale at which to evaluate fire regimes and ecological departure for FRCC determination (Hann et al 2003), the current condition is FR1CC3 at 66.4% departure. The percentage range defining high departure is 66% to 100%.

Air Quality

Activities that will create smoke emissions must follow the State of Oregon Smoke Management Plan (SSMP).

The Strawberry Mountain Wilderness is a Class I air shed. The Strawberry Wilderness is approximately 13 miles southwest of the project. In class I areas, only very small increments of new pollution above already existing air pollution levels are allowed. The State haze designated visibility protection periods for class 1 air sheds from July 1st to September 15th for all of Oregon.

The surrounding communities of John Day, Burns and Baker City are listed in the SSMP as Smoke Sensitive Receptor Areas and thus protected by the highest standards in the plan.

The prevailing winds are from the southwest and west. During the day, diurnal heating forces air up valley and up slope out of the area. During the night, air follows the drainages in the area downstream. Inversions affect air quality the most during the winter months, but during the rest of the year inversions sometimes develop in the morning hours and dissipate by noon.

Currently, air quality in surrounding sensitive areas is limited to short term impacts. These impacts result from wood burning, prescribed burning, and field burning to the west. The greatest impact to the wilderness area is from field burning in the Willamette Valley and Central Oregon and from summer wildfires that occur to the south and west. These sources affect haziness and can last for several days in the spring and summer.

In compliance with the Clean Air Act, prescribed burning of any kind will not occur unless prior approval is granted by Oregon Department of Forestry. The Clean Air Act sets air quality standards for particulate matter (PM) for particles less than 10 microns in diameter (PM 10) and less than 2.5 microns in diameter (PM 2.5). All amounts of PM10 and PM 2.5 emissions will be calculated using the CONSUME software in the Fasttracks reporting system, which is also submitted with planned burn operations to the Oregon Department of Forestry to determine compliance with the Clean Air Act. State smoke forecasts which predict wind direction and smoke mixing height, will be obtained prior to all burning to insure smoke intrusions will not occur in the local smoke sensitive receptor areas.

Burning will follow the guidance provided by the Oregon Smoke Management Plan and specifically, Directive 1-4-1-601, the Operational Guidance for the Oregon Smoke Management Program. This agreement is between the NE Oregon federal land management agencies and Oregon ODF. It limits smoke emissions to 17,000 tons of particulate a year. It is assumed that 2,000 tons is produced from wildland fires, with 15,000 tons allowed for prescribed burning. It is agreed that this level of activity will not degrade regional air quality. ODF monitors activity, and if the 15,000 ton limit is reached will shut down prescribed fire activity.

Each state, including Oregon, has a State Implementation Plan (SIP) which provides the means by which these goals are to be attained. The SIP may contain measures such as emission standards for air pollution sources, air quality permit programs, and regulations controlling specific air pollutant sources such as mobile sources, wood-burning stoves and slash burning.

Atmospheric Carbon and Climate Change

Forests sequester large amounts of carbon from the atmosphere which can be released by wildfires. Globally, about 1/3 of the total carbon inputs to the atmosphere are from burning forests. Currently the material in the Dads Creek area is likely to be released back into the atmosphere rather than be sequestered in durable products or replacing fossil fuels in energy production.

Environmental Consequences

Alternative 1 - No Action

This alternative does not reduce or increase fuels by commercial harvest, pre-commercial thinning, mechanical surface fuel treatment, or prescribed fire. The effect of no action would be more difficult and less successful protection of life and property because of increased potential for uncharacteristic, crown fire behavior. Fire severity with detrimental effects to vegetation and soils would be high.

Direct and Indirect Effects

Fire Hazard

The effect of no action would be to see increased potential for uncharacteristic, crown fire behavior. With increases in ladder fuels from the high stocking levels in the understory, low canopy base height, and high canopy bulk density, the expected fire behavior for much of the project area is not of low severity surface fires, as it was historically, but has the potential for high severity effects to the vegetation and soils.

If a wildfire occurs, the hazard of erosion would greatly increase on severely burned areas due to inadequate ground cover and possibly hydrophobic soil. In addition nutrients and organic matter would be lost.

Large ponderosa pines would continue to be vulnerable to mortality from wildfires due to deep accumulations of duff that has built up and would continue to build around the base of the boles and due to ladder fuels. They are also threatened by the current overstocking. This overstocking would increase under this Alternative. Forested areas on Douglas-fir and grand fir sites that historically were dominated by ponderosa pine would continue toward their climax vegetation. Native shrubs and other native ground vegetation in the project area are adapted to low severity fire. The absence of low severity fire has had adverse effects on these plants that have also been adversely impacted by the shading and competition from conifers. When wildfires occur, the severity would be greater with this alternative, possibly killing plants that would otherwise have the ability to sprout after a low severity fire.

Surface Fuels

If no action is taken, the project area would increase in the potential for stand replacing fire rather than the low-intensity-and-severity fires that historically occurred. Surface fuels including downed-woody material, needle litter, and duff accumulation would increase from current levels, contributing to the potential for stand replacing fire.

In 20 years, the total area having a heavy fuel load will have increased 4 times. These departures from the existing condition and from the desired condition to models with heavier fuel loadings indicate fires would burn with high intensity and severity. High heat intensity, torching, spotting, and crowning may be expected during wildfire events and resistance to control would be high. This makes protection of life and property more difficult and chances for successful suppression less.

Table F-4 Fuel Loadings and Percent of Area in 20 years with no treatment

Alternative	Loading for Areas With Light Fuel Loads (Approx)	Loading for Areas With Moderate Fuel Loads (Approx)	Loading for Areas With Heavy Fuel Loads (Approx)
Existing Condition	5379 acres (72%)	1345 acres (18%)	747 acres (10%)
No Action in 20 Years	2839 acres (38%)	1569 acres (21%)	3063 acres (41%)

Ladder and Crown Fuels

The continuity and density of tree canopies would provide conditions that enable rapidly moving crown fire. Overstocked stands would continue to slow in growth. Stand density would increase and tree vigor would decrease. The overall resiliency to withstand natural disturbances would continue to decrease. Late seral species would continue to increase in mixed species stands.

As stated above, canopy bulk density and crown base height are factors contributing to crown fire. The crown bulk density increases to .13 kg/m3 and the crown base height stays about the same. Stands with these canopy base heights and canopy bulk densities can burn as an active crown fire.

Crown Fire Initiation Potential

This area historically had rather short fire free periods that prevented high fuel loads to accumulate and limited the layers within the stand. There is a 12% increase in area with high to extreme crown fire initiation potential. Overall, there is at least 70% of the forested stands within the project area that has higher potential for crown fire than would have occurred under conditions characteristic of Fire regime 1 (see Map 8 in Appendix B). The amount of active and passive crown fire increases and the amount of surface fire decreases across the project area.

Table F-5 Crown Fire Potential in 20 years with no treatments

Crown Fire Potential	Existing Crown Fire Potential - % of the project area	Crown Fire Potential in 20 Years - % of project area	Percent Change from Existing Condition
Extreme	7%	12%	+5%
Very-High	24%	26%	+2%
High	27%	32%	+5%
Medium	42%	30%	-12%
Low	0%	0%	0%

Table F-6 Fire Type in 20 years with no treatments

Fire Type	Existing Fire Type - % of the project area	Fire Type with No Treatments in 20 years - % of project area	Percent Change from Existing Condition
Active Crown Fire	31%	38%	+7%
Passive Crown Fire	27%	32%	+5%
Surface Fire	42%	30%	-12%

Fire Regime Condition Class

As stated earlier, fire regime 1 represents the hot dry and warm dry plant association groups and comprises approximately 84% of the project area. A fire under current conditions would not burn as a low severity surface fire. Fires would be mixed severity to stand replacing with detrimental effects to other resources that did not historically occur.

The vegetation condition is another ecological component that would continue to contribute to the departure from the natural fire regime. Tree densities would continue to increase and species would continue the shift to having higher proportions of shade tolerant, fire susceptible fir. Stand conditions would increase susceptibility to insect and disease effects at levels that are highly departed from the natural fire regime. The Condition Class for the project area would continue to depart further from the natural fire regime.

Air Quality and Climate Change

No action would have the least immediate impact on air quality, as there is no prescribed burning or pile burning. All biomass does remain available for consumption by wildfires and it would continue to accumulate, increasing the potential for large amounts of smoke during the summer months, when diurnal inversions can concentrate smoke at low elevations. Because wildfires tend to occur at the driest time of the year, fuels are more completely consumed and typically produce three to five times more emissions than early or late season prescribed fires. There is a potential during a wildfire for approximately 440 pounds per acre of PM2.5 emissions. These smoke concentrations can have high particulate levels that can cause health problems, or violate summertime Class I air quality visibility standards for Wilderness areas. The communities of Prairie City, Baker City, Unity, and John Day would be impacted by smoke from a wildfire in this area.

No action would have an adverse effect on the carbon cycle and climate change. The biomass that has accumulated is prone to be released back into the atmosphere by either combustion in a wild fire or by decomposition.

Cumulative Effects

All activities in Appendix C have been considered for their cumulative effects on fire and fuels. The following discussion focuses on those past, ongoing, and foreseeable activities that may contribute effects to fire or fuels. The area considered for cumulative effects is the Dads Creek Sub-watershed. The time period considered for cumulative effects begins 100 years ago when active forest management, domestic livestock grazing and fire suppression started occurring extensively in the area and continues for 20 years following the initial operations planned with this project.

Past actions including fire suppression, timber harvest, and grazing have contributed to the current conditions of fuels and the departure from the natural disturbance regime. These actions have resulted in increases in understory vegetation and surface fuels, changes in species composition and vegetative continuity. The past road construction enabled fire suppression personnel to more easily access fire starts and contributed to successful fire suppression. 1,115 acres of regeneration harvest have occurred in the past that have converted those stands to more fire resistant tree species, but are in the early seral stage and currently overstocked and at risk to high mortality from fire. The 1,027 acres of precommercial thinning reduced canopy and ladder fuels but the stands have grown to the point that the crowns are becoming denser and many acres are still overstocked needing additional fuel reduction treatments. The 514 acres of underburning and broadcast burning reduced surface fuels and ladder fuels. Fire suppression would continue as an ongoing activity but would get increasingly more difficult as fuels increase.

The fuel treatments on other ownerships reduce the chance of a severe wildfire on those ownerships. Not treating this area doesn't contribute to landscape fuel reduction with those adjacent and nearby lands. No action of this project effects other present and ongoing actions described in Appendix C in that the potential for high intensity and high severity wildfire increases and would effect all action if one were to occur. The future prescribed burning would not likely occur with No Action under this proposal, as the heavy fuel loadings would make it difficult to control.

Alternative 2 - Proposed Action

The proposed action is designed to protect lives and property within the rural/urban community interface adjacent to National Forest lands. To provide protection there is a need to remove hazardous fuels from the area and manage forest vegetation to reduce the risk of uncharacteristic, severe fire moving from the Forest into private property by reducing fuels in the three fuel layers. Crown or canopy fuels and ladder fuels would be reduced by commercial and precommercial treatments. Surface fuels would be reduced through hand or grapple piling, burning the piles, removal of slash for utilization, and/or underburning. To best protect lives and property by modifying fire behavior, fuel reduction treatments were emphasized adjacent to private owned lands.

The proposed action addresses the risk factors of the Grant County Community Fire Protection Plan, thereby improving fire fighting effectiveness to protect life and property.

Commercial fuel reduction treatments would be accomplished by generally thinning the smaller diameter trees and retaining the larger trees at a variable spacing. There would also be some species conversion from fire and insect prone late seral species to more resistant early seral species by selective thinning and by regeneration harvesting. The focus of the thinning would be largely on smaller diameter trees found either below the main forest canopy or within the canopy where tree crown density would allow the spread of crown fire. Mechanical treatments would remove ladder fuels that carry fire into the tree crowns.

Non-commercial falling of small diameter trees would also reduce ladder fuels and the continuity of the tree crowns. This is proposed both within the areas treated by the commercial fuel reduction treatments and in areas where there is little commercial material but there is still a need to remove the smaller trees.

Of the 7,200 acre project area, approximately half of the area will be treated to reduce or maintain fire behavior and severity. These treatments will break up the continuity of hazardous fuels across the project area.

Direct and Indirect Effects

Fire Hazard

An overall effect of the proposed action would be a reduction of canopy fuels, ladder fuels, and surface fuels which would contribute to successful fire suppression and protection of life and property under most fire scenarios. Mechanical fuel treatments that reduce ladder and canopy fuels would have a direct effect on canopy base height and crown bulk density. The continuity of the fuels within the project area is broken up especially along boundaries with private lands.

Surface Fuels

There is a short-term increase in fire hazard following treatment and prior to slash disposal when fuels remain in the units and on the ground. Existing surface fuels and created slash would be treated by one or a combination of methods. Yarding tops to landings for utilization or disposal by burning is one method. Pile burning would occur during the first burning window after piling is complete. Another method proposed is removal of the slash for utilization. Other treatments include handpiling and burning, grapple piling and burning, and application of understory prescribed fire. These treatments reduce the surface fuel load. All units include treatments to reduce the surface fuels to mitigate the possible increase in surface wind movement and drier fuels. A prescribed burning program into the future will be needed to maintain the desired fuel levels and limit regeneration from becoming a ladder fuel concern as well as a stand density concern.

Van Wagtendonk (1996) found in fire simulations that a reduction in fuel loads decreased subsequent fire behavior, increased fireline control possibilities and decreased fire suppression costs. Efficient fireline construction rates are also enhanced where fuel reduction has occurred, which decreases resistance to control (Agee et al 2000). Increased fireline control leads to enhanced firefighter safety.

The beneficial effects of prescribed fire on altering fuel structure and wildfire behavior and effects have long been observed and reported. Prescribed fire is a useful tool to alter potential fire behavior by influencing multiple fuel bed characteristics, including:

- Reducing loading of fine fuels, duff, large woody fuels, rotten material, shrubs, and other live surface fuels, which together with compactness and continuity change the fuel energy stored on the site and potential spread rate and intensity.

- Reducing the horizontal fuel continuity (shrub, low vegetation, woody fuel strata), which disrupts growth of surface fires, limits the buildup of intensity, and reduces spot fire ignition probability.

- Increasing compactness of surface fuel components, which retards combustion rates (Graham et al. 2004).

Prescribed burning reduces downed woody material and ladder fuels including removal of some understory trees. Prescribed burning often scorches the lowest tree branches, resulting in a pruning which raise the live crown above the ground surface. Prescribed burning can reduce fire intensity and severity from wildfires (Omi, Martinson 2002, and Pollet, Omi, 2002). The primary stand attributes that control fire behavior are surface fuel condition, crown bulk density, and crown base height (Graham 1999). In a study of the effects of low intensity fires on ponderosa pine forests in Zion National Park, needle/litter fuel load layer was reduced by 54 percent, duff loading was reduced by 35 percent, and pole sized trees were reduced by 18 percent (Bastian 2001). With the reduction in ladder fuels, there would be a reduced probability of a surface fire moving into the tree crowns.

The proposed prescribed burning is all within the warm-dry and hot dry biophysical environments and fire regime 1. Underburning is proposed within 1,467 acres that would be treated mechanically first and within 1,065 acres outside of treatment units. The objective for the surface fuels is to reduce loadings to desirable levels. Mortality in the smaller diameter trees is acceptable. Mortality of larger diameter trees would be minimized as described in the project design. Lighting would occur in RHCA's with an objective to reduce the surface fuels. By lighting within the RHCA 's lighting patterns can be utilized that will best meet the surface fuel reduction with limited tree mortality and soil exposure. Soil effects from prescribed burning would be minor. Burning would take place so as to avoid decreasing ground cover below LRMP standards, so erosion would not be significant.

In 20 years following the proposed treatments, nearly 24% more area will be classified as having a low fuel load compared to no action. Surface fuel conditions will further improve if follow up maintenance burning is implemented at least one more time in the next 20 years. Surface fuels will become dominated with grasses (fuel model 2) in treated stands. The rate at which a fire moves through these stands will be higher than stands with a greater component of larger woody fuels and denser tree stocking. Wind will be less restricted and fine fuels such as cured grasses burn more readily. While increased surface-fire intensity (flame-length) under extreme fire-weather conditions is not desirable, the combination of modified surface, ladder, and canopy fuels still suggests improved firefighting capability even under difficult weather circumstances, and also reduced fire severity (resource impacts). These expected outcomes are the result of less crown-fire potential and thus lower overall intensity and lower severity to soils.

Table F-7 Fuel Loadings by Area after treatments of the Proposed Action at 20 Years

Alternative	Areas with Light Fuel Loads	Areas with Moderate Fuel Loads	Areas with Heavy Fuel Loads
No Action 2028	2,647 acres (38%)	1,507 acres (21%)	2,918 acres (41%)
Proposed Action 2028	4,353 acres (62%)	542 acres (8%)	2,178 acres (30%)

Ladder and Crown Fuels

Mechanical thinning can be effective in reducing vertical fuel continuity that contributes to the initiation of crown fires, especially when the thinning emphasizes the smaller trees. The net effect of removing ladder fuels is that surface fire burning through treated stands are less likely to ignite the overstory canopy fuels (Graham et al. 2004). Thinning is potentially effective at reducing the probability of crown-fire spread, and is precise in that specific trees are targeted and removed from the fuels bed. Commercial and precommercial cutting would be accomplished by thinning from below so the smaller diameter trees would be cut and the larger trees retained. This would reduce canopy fuels, ladder fuels, and continuity of the tree crowns.

There is a concern that has been raised that removal of the canopy level trees can increase fire risk. As Peterson (2005) points out, in some cases, removal of trees from the canopy and understory could increase surface wind movement, and facilitate the drying of live and dead fuel, although effective removal should mitigate these factors by reducing the fuel load and potential for fire spread. Agee & Skinner (2005) states that sufficient surface fuel treatment after thinning provides an overall reduction in expected fire behavior and fire severity that usually outweighs the changes in wind speed and fuel moisture. The overall reduction of surface, ladder, and crown fuels, in addition to reducing the fuel continuity, reduces crown fire potential and improves firefighter's ability to control a wildfire.

Other benefits of these treatments include increased growth and improved vigor on residual trees, which in turn decreases their susceptibility to mortality from insects and disease. Observations by Cram et al (2006) that mechanical treatment followed by prescribed fire (including pile burning) had the greatest influence toward mitigating fire severity. Specifically, as density and basal area decreased and mean tree diameter increased, fire severity decreased. See the vegetation section for additional effects on composition and density, and structural stages.

Canopy base height, canopy bulk density, and canopy continuity are key characteristics of forest structure that affect the initiation and propagation of crown fire. The average crown base height across the project area increases from 8 feet to 16 feet. This higher canopy base height reduces the potential for tree torching. The average canopy bulk density of treated units is .06 kg/m3, a .04 kg/m3 decrease. Stands with this canopy bulk density will not burn with an active crown fire.

Reducing the fuel loadings, fuel continuity, and the availability of ladder fuels keeps fire confined as a surface fire and reduces the occurrence of firebrands, which increases the ability to control fires. In the WUI, reducing the threat of ignition from firebrands requires reducing fuels both near and at some distance from the structures. Proposed treatments reduce the likelihood of firebrands being lofted from fires onto private land and structures. This improves our ability to protect life and property.

Crown Fire Initiation Potential

After the treatments of the proposed action, approximately 59% of the project area has a low to moderate potential for crown fire and these areas are located in treatment units primarily along boundaries with other ownerships. These areas of low and moderate crown fire potential break up the continuity of fuels in order to change fire behavior. The Proposed Action decreased the amount of area with a high to extreme potential for crown fire by 17%. The areas remaining with higher potentials are scattered across the project area not in contiguous blocks. These factors will contribute to successful fire suppression and protection of life and property under most fire scenarios. It is important to keep in mind when looking at the percentages that approximately 48% of the project area diagnosed for treatment is not being treated but are included in the tables. These acres are not proposed for treatment because fire hazard could not be reduced sufficiently and still meet forest plan direction for other resource needs. Many of these areas will still be at risk for active crown fire but are not continuous and are not concentrated adjacent to private lands. In stands that are being treated, the changes are more apparent (see Maps 16 and 17 in Appendix B). The area at risk for active or passive crown fire decreases by 17% across the project area.

A maintenance burning program is needed in the future to limit regeneration and maintain low levels of surface fuels. Without maintenance burning, future conditions will begin moving back towards the existing condition as shown on Map 17 (Appendix B). The modeling for this project applied prescribed burning once and doesn't include any future maintenance burning over the next 20 years. By implementing a maintenance burning program the crown fire potential would be kept similar to that directly after completion of the treatments in the proposed action as regeneration would be kept at low levels, not creating ladder fuels and the surface fuels would be kept at low levels.

Table F-8 Crown Fire Initiation Potential 20 Years After Proposed Action

Crown Fire Initiation Potential	% of Project Area Existing Condition	% of Project Area After Treatments	% Change Compared to Existing Condition
Extreme	7%	6%	-1%
Very-High	24%	19%	-5%
High	27%	16%	-9%
Medium	42%	48%	+6%
Low	0%	11%	+11%

Table F-9 Fire Type in 20 After Proposed Action

Fire Type	Existing Fire Type - % of the project area	Fire Type with Proposed Treatments in 20 years - % of project area	Percent Change from Existing Condition
Active Crown Fire	31%	25%	-6%
Passive Crown Fire	27%	16%	-11%
Surface Fire	42%	59%	+17%

The stands proposed for treatment, stands currently with a low crown fire potential, non-forested and non-vegetated stands all contribute on the landscape to breaking up fuel continuity. When all these stands are considered, the pattern on the landscape will modify fire behavior and reduce fire growth, allowing for protection of life and property.

Fire Regime Condition Class

Fire regime 1, a low severity but high frequency regime, comprises approximately 84% of the project area. Treatments will change vegetation characteristics including stand density, species composition, and structural stage. Treatments will also change fuel composition and potential fire severity, components relating to change from reference conditions. After completion of all mechanical treatment and prescribed burning on the 3,890 proposed acres, these stands will begin moving towards a Condition Class 1. Maintenance burning in these stands will further move them towards Condition Class 1.

Untreated Fire Regime I stands will remain in the existing FRCC and most will depart further from the reference conditions, moving them further into FRCC 3.

At the landscape scale, the appropriate scale at which to evaluate fire regimes and ecological departure for FRCC determination (Hann et al 2003), the project area after the treatments of the Proposed Action moves from an overall FRCC rating of 3 to FRCC 2.

Treatments result in a project area FRCC2 but with a lower percentage indicating some stands would be considered in a Condition Class 1. The increased tree growth from thinning would cause the development of old forest structural stages to accelerate, allowing the thinned stands to grow into the large size classes sooner. In the Warm Dry biophysical environment old forest single strata is projected to increase from 0% to 37%. As structure approaches the historic range of variability and with continued maintenance burning to sustain low fuel levels, the FRCC percentage number will decrease (moving into FRCC1) as the ecological departures decrease.

Air Quality and Climate Change

Approximately 100-140 lbs/acre of PM2.5 emissions and 120-180 lbs/acre of PM10 emissions are produced from prescribed burning. This is substantially less per acre emissions than a wildfire. There will be short term impacts to communities and residences down wind and in drainages adjacent to prescribed fire. There will also be short term impacts along Highway 26. Biomass utilization will be encouraged to further reduce emissions from prescribed fire. All prescribed burning will comply with all applicable federal, state and local air quality regulations. Smoke emissions from potential wildfires are reduced from existing conditions due to reductions in available fuels in the canopy and on the surface from activities in the proposed action.

The proposed action would have a positive effect on the carbon cycle and climate change. The biomass that has accumulated is prone to be released back into the atmosphere by either combustion in a wild fire or by decomposition. Converting a portion of it into durable products like lumber or into paper that would eventually either be recycled or buried in a landfill would take that portion out of the atmosphere. Additionally, any biomass used for power generation would allow that amount of fossil fuels to remain sequestered in the ground.

Cumulative Effects

All activities in Appendix C have been considered for their cumulative effects on fire and fuels. The area considered for cumulative effects is the Dads Creek Sub-watershed. The time period considered for cumulative effects begins 100 years ago when active forest management, domestic livestock grazing and fire suppression started occurring extensively in the area and continues for 20 years following the initial operations planned with this project. This future time period includes potentially two fire cycles, if the area where in its natural fire regime, after completion of the proposed treatments. The following discussion focuses on those past, ongoing, and foreseeable activities that may contribute effects to fire or fuels.

Past actions including fire suppression, timber harvest, and grazing have contributed to the current conditions of fuels and the departure from the natural disturbance regime. These actions have resulted in increases in understory vegetation and surface fuels, changes in species composition and vegetative continuity. Past grazing reduced fine fuels at varying levels depending on the intensity of grazing which reduced potential fire spread. The past road construction enabled fire suppression personnel to more easily access fire starts and contributed to successful fire suppression. Nearly two thirds of the 1,115 acres of past regeneration harvest units will receive pre-commercial thinning and slash treatment to reduce stocking and fire severity. Much of the 1,027 acres that received previous pre-commercial thinning treatments will now be treated with either underburning or commercial thinning to maintain or enhance the current fuels condition. Past prescribed fire on 514 acres reduced surface fuels and ladder fuels and these areas are available for maintenance burning under this proposed action.

Cumulatively, this project, in combination with the fuel treatments on private ownerships, would have a positive effect on protection of life and property and reduction in the potential for a severe wildfire across the landscape. Fire suppression will continue as an ongoing activity and the probability of successful suppression will improve with the above mentioned projects.

Future grazing will continue to affect fine fuels. This can impact the implementation of prescribed fire and meeting objectives if it removes the fuel (grasses) to carry fire. Grazing management and fuels management need be coordinated to best meet objectives of both.

Future prescribed burning would be necessary to maintain fuels at desirable levels and limit ingrowth. If a maintenance burning program is not implemented future conditions will be represented as shown on Map 17 (Appendix B). The modeling for this project applied prescribed burning once in the first decade and not intervals over the next 50 years. By implementing a maintenance burning program the crown fire potential would be kept similar to that of the proposed action as regeneration would be kept at low levels, not creating ladder fuels and the surface fuels.

Consistency with Direction and Regulations

The No Action Alternative does not meet the Forest Plan direction 1) initiate initial management action that provides for the most reasonable probability of minimizing fire suppression costs and resource damage, consistent with probable fire behavior, resource impacts, safety, and smoke management and 2) identify, develop, and maintain fuel profiles that contribute to the most cost-efficient fire protection program consistent with management direction (Forest Plan IV-4).

The No Action Alternative also does not meet the objectives of the Grant County Community Fire Protection Plan or the Healthy Forest Restoration Act.

The Proposed Action meets the Forest Plan direction as stated above.

The Proposed Action is also consistent with the objectives of the Grant County Community Fire Protection Plan and the Healthy Forest Restoration Act because it reduces hazardous fuel to protect lives and property.

Irreversible and Irretrievable Commitments

There are no irreversible and irretrievable commitments of resources that may result from the proposed action with respect to fire and fuels.

Forest Vegetation

Introduction

The following discussion assumes that all of the project design features for each alternative are carried out as described in Chapter 2. The silvicultural aspects and implications to the affected environment and environmental consequences of the treatments will be covered.

Definition of Terms

Mechanical Treatments – Vegetation changes done by mechanical cutting methods instead of by other means, such as prescribed burning.

Precommercial thinning – Thinning in tree stands where the trees to be cut are not merchantable saw log sized material (1” to 9” dbh). The objective is to reduce ladder fuels, reduce the amount of live and dead fuels, and increase tree growth.

Commercial thinning – This prescription would thin small/medium size trees (7 to 20.9” dbh) in immature forest stands by thinning from below to reduce stocking levels. The goal is to reduce canopy fuels, enhance individual tree growth, and to allow for the reintroduction of fire. Thinning from below means the majority of the trees to be cut are in the smallest diameter sizes (9 to 14” dbh) and relatively few trees would be cut in the medium diameters (15 to 20.9” dbh).

Convert to early seral species – This prescription seeks to reduce the effects of fir ingrowth into stands that historically had a frequent fire return. These stands are presently in a condition where fire would most likely cause high mortality, the objective is to return it into a condition where fire can eventually be re-introduced and allowed to play its natural role. It would remove late seral species trees from the middle and understory, thin early seral species trees where they are over stocked, and reforest any resulting understocked areas to historic stocking levels. Where early seral species trees are not available, a minimum of 20 trees per acre would be left to provide structural variety and future large snag recruitment.

Understory removal - A thinning from below that removes both commercial and precommercial sized trees (1” to 20.9” dbh) from multi-storied stands. The result is a thinning from below to reduce ladder and canopy fuels and to enhance the survivability of the larger trees in the stand from fire and insect attack.

Reference Condition - The vegetation resulting from conditions and disturbances that existed prior to European - American settlement, which began in the 1850’s. Used as a baseline for “natural” conditions.

Current Condition - The current forest vegetation resulting from actions taken over the last 150 years, in combination with natural processes. Some of the actions include grazing, mining, logging, and fire suppression.

Desired Condition – Forest vegetation resilient to natural disturbances and where disturbances result in historic patch sizes.

Historic Range of Vegetation (HRV) – The expected range of variation in ecosystem composition and structure that would be anticipated (similar to historic conditions before European - American settlement) under natural disturbance regimes in the current climatic period.

Biophysical Environments – PAG (Plant Association Groups) - Vegetation classification using similar moisture and temperature environments resulting in similar fire regimes.

Hot Dry Forest – Occupies low to mid elevations and mainly south slopes. Stands are composed primarily of ponderosa pine. Fire regime is low intensity, high frequency (10-15 years) over most of the area, with small patches of mortality.

Warm Dry Forest – Occupy low to mid elevations and south slopes at higher elevations. Stands are composed of ponderosa pine, Douglas-fir, lodgepole, grand fir, and western larch. Fire regime is low intensity, high frequency (10-15 years) over most of the area, with small patches of mortality.

Warm Moist Forest – Similar to warm dry, but located in areas of more moisture with more shrubs such as ninebark, shrub maples, and oceanspray in the understory. Fire regime is low intensity, high frequency (10-15 years) over most of the area, with small patches of mortality.

Cool Moist Forest – Occupy mid elevations, northerly aspects and cooler, wetter draw bottoms. Stands are composed of ponderosa pine, Douglas-fir, grand fir, lodgepole pine, western white pine, and western larch. Fire regime is mixed, with low intensity, high frequency (10-15 years) regime overlaid with a high intensity, low frequency (100-200 years) regime. Patch size would range from 200 to 2,000 acres.

Cool Dry Forest – Occupy mid to higher elevations, northerly aspects and cooler areas that are relatively dry. Stands are composed of ponderosa pine, Douglas-fir, grand fir, lodgepole pine, western white pine, and western larch. Fire regime is mixed, with low intensity, high frequency (10-15 years) regime overlaid with a high intensity, low frequency (100-200 years) regime. Patch size would range from 200 to 2,000 acres.

Cold Dry Forest – Occupy high elevation sites, northerly aspects, and colder, relatively dry areas. Stands are composed of Englemann spruce, subalpine fir, whitebark pine, and lodgepole pine and the fire regime is high intensity, low frequency (50-275+ years) with noticeable susceptibility to torching and crown fires.

Woodlands – Occupy dry sites at low to mid elevations, often on south slopes. Stands were historically open ponderosa pine savannahs and sparse western juniper that was maintained by frequent fires.

Structural Stage – Classification of forest stands by developmental stage and size.

Stand Initiation (SI) – A single canopy stratum of seedlings and saplings established after a stand replacing disturbance.

Stem Exclusion Open Canopy (SEOC) – A single canopy stratum of pole to small saw sized timber that excludes an understory by lack of water.

Stem Exclusion Closed Canopy (SECC) – A single canopy stratum of pole to small saw sized timber that excludes an understory by shade.

Understory Reinitiation (UR) – The overstory has been opened up by natural mortality or thinning, allowing an understory to become established.

Young Forest Multi Strata (YFMS) – Multiple canopy layers provide vertical and horizontal diversity with a mix of tree sizes. Large trees are absent or at low stocking levels.

Old Forest Single Strata (OFSS) – Large trees are frequent, limited understory and one canopy level.

Old Forest Multi Strata (OFMS) – Large trees are frequent, has multiple canopies.

Existing Condition

Analysis Area Past Actions

Settlement by European immigrants began in the mid-1800's, initially by those involved in mining and grazing. Timber harvesting was localized, mainly for mine props and buildings. In the early 20th century much of the western portion of the Dads area was harvested by railroad logging. The early 1900's also saw the formation of the National Forests and eventually fire suppression, which along with intensive grazing reduced the amount of fires to a low level. In the last two decades harvest in the eastern portion of the Dads Creek area has thinned and regenerated a number of stands.

The combination of timber harvest and fire suppression gradually converted forests from early seral species to a higher proportion of late seral species. Stand densities and multi-layer canopies also increased across the forests. These late seral trees are not resistant to forest insects, diseases, or to fire.

Within the last three decades there have been several outbreaks or defoliating insects and bark beetles that have caused widespread mortality. Large, high severity fires have burned across the forest including areas that historically burned at a low intensity but at frequent intervals. Every year there are several small wildfires in the area ignited by lightning that are usually rapidly suppressed. Nearby fires in recent history that have escaped initial attack are the Deardorf Fire in 1986, the Glacier Fire in 1989, the Snow and Sheep Fires in 1990, the 11,000 acre Wildcat Fire in 1996, the 30,000 acre Summit Fire in 1996, and the 6,000 acre Easy Fire in 2002. These have been fueled by the increased dead and down timber, dense stands, and multiple crown layers creating ladder fuels into the upper tree crowns.

Biotic Conditions

Information concerning stands has been gathered through a combination of photo interpretation, formal timber stand exams in 1992 and 2007, and walk-throughs in 2006 and 2007. The analysis area for determining the Historic Range of Variation (HRV) consists of the Dads sub-watershed that contains the project area.

The lower elevations and south facing slopes are generally ponderosa pine plant associations with ground vegetation of pine grass, elk sedge, and common snowberry. Other tree species include western larch, Douglas-fir, lodgepole pine and grand fir. These stands are generally young and even-aged due to the nature of past harvests. There is low structural diversity and a lack of larger diameter trees and snags. The limiting factors to vegetative growth are competition for water and soil nutrients.

The rest of the plant associations are predominantly Douglas-fir and grand fir climax and contain grand fir, Douglas-fir, western larch, lodgepole pine and ponderosa pine. Pinegrass, twinflower, grouse huckleberry, and big huckleberry dominate ground vegetation. These stands are typically overstocked multi-stratum canopies that are at high risk for insect and disease problems and stand replacement fire. Lodgepole pine with ground vegetation of grouse huckleberry occurs in the upper elevations.

The plant associations are grouped into biophysical environments that function somewhat alike. There are seven forested biophysical environments (plant association groups) that occur within the analysis area as displayed in the table below. Of these the Warm Dry biophysical environment is by far the most common, (see Map 3 - Biophysical Environments in Appendix B).

Table V-1: Biophysical Environments

Biophysical Environment	Acres within the Analysis Area	Percent within the Analysis Area
Hot-Dry	194	3 %
Warm-Dry	6,073	81 %
Warm Moist	229	3 %
Cool-Dry	38	<1 %
Cool-Moist	874	12 %
Cold-Dry (Lodgepole)	32	<1 %
Non Forest	29	<1 %

The majority of the planning area is in the warm dry biophysical environment. The plant association groups that comprise minor proportions of the analysis area (3% or less) are not discussed in detail in this section, refer to the Silviculture specialists report for detailed discussions of each biophysical environment.

Warm Dry Biophysical Environment

Warm dry forests occupy approximately 6,073 acres (81% of the analysis area). By far they are the most prevalent plant association group in the Dads Creek WUI project area. They occur across a range of soils (volcanic ash as well as mixed and residual soils - gravely to cobbly loams, clay loams) and all aspects ranging from high to lower elevations.

Warm dry forests are represented by an array of plant associations, indicating the wide range of environments they occupy. Species compositions range from nearly pure ponderosa pine to mixes of ponderosa pine, Douglas-fir, grand fir, western larch, and lodgepole pine. The warm dry forest includes most of the Douglas-fir plant associations and the drier grand fir plant associations (up to and including the grand fir/grouse huckleberry assoc.), since they all were subject to frequent, low intensity fires that maintained early seral species in the stands.

Species Compositions and Successional Development

The low intensity/high frequency disturbance regime common in this forest type favored fire resistant species (ponderosa pine, western larch, and to a lesser extent Douglas-fir) and development of more open stands with little vertical structure. Shade tolerant species (grand fir and Douglas-fir) were generally susceptible to these fires due to their thinner bark when young and persistent, low hanging crown characteristics. This was also true for moist forests occurring in the transitional area with dry forests. Smaller understory trees were vulnerable to periodic fires, surviving only in openings with too little fuels to carry a fire. The extent of these frequent ground fires likely varied from small areas (less than 10 acres in size) to entire slopes covering thousands of acres depending upon the season, topography, and climatic conditions. The intensity also varied in response to vegetative conditions. Areas missed by frequent fires (moister northerly aspects) developed conditions where subsequent fires could potentially be of moderate to high intensity, resulting in patches of stand replacement/regeneration.

Overall, the frequency of these fires made them an agent of stability in these forest ecosystems. They kept the ground vegetation dominated by fire adapted grasses (such as pine grass and elk sedge) and shrubs (ceanothus, snowberry, Oregon grape), while promoting and maintaining mature forest vegetation dominated by early seral species, such as ponderosa pine, western larch and, to a lesser extent, Douglas-fir. Because of the stabilizing effect of these fires, stands tended to be maintained with early seral species and larger fire resistant trees. Succession to shade tolerant species and associated multi-strata structures only occurred in areas that escaped several fire cycles.

Disturbance Processes

Warm dry forests have been affected by a variety of disturbances. These include: insects; diseases; fire; and human related disturbances such as timber harvest, fire suppression, and grazing. Fire is by far the major natural disturbance agent in dry forests. Other disturbance agents in this forest type include a variety of insects and diseases. In general, these disturbance agents added to the structural diversity of these stands by providing small areas/openings for regeneration and understory vegetation to establish.

Fire

Historic fire disturbance regimes in these forest environments can be best characterized as high frequency/low intensity. Fires started by natural ignition (i.e. lightning) or American Indian people burned in the form of underburns and small areas of lethal fires on a frequency of every 10-35 years in these forest types (Agee 1993, Hall 1977). These fires helped to maintain stands with high proportions of fire tolerant species and large areas of relatively open, park like conditions. Small areas of denser forest patches occurred in areas missed or more resistant to fire (draws, spring seep areas, wetter aspects).

Recent fires on the Malheur National Forest have been large, stand replacement events that are very out of character with the historical fires that occurred. The Summit Fire covered 30,000 acres, of which over half of the fire occurred in the warm dry forest biophysical environment. The Summit Fire burned with stand replacement intensity across ¾ of the area burned, much more intensive than historical fires would have burned in this biophysical environment. The Flagtail Fire burned 7,000 acres with similar intensities and was also primarily located in the warm dry plant association group.

Insects

The western pine beetle was the primary bark beetle working in the stands historically dominated by larger diameter ponderosa pine. Scattered individual tree mortality created small openings in stands where pockets of understory could establish. Mountain pine beetle and pine engraver were likely present at low levels due to the overall lack of suitable habitat (i.e. dense thickets of smaller diameter trees). Denser stands with a high proportion of sapling to pole sized ponderosa pine have increased levels of mountain pine beetle and Ips beetle activity and associated mortality. Western pine beetle is also present across dry forests, keying in on highly stressed larger overstory ponderosa pine. Fir engraver activity is currently prevalent in dry forests due to the combination of high stand densities and increased proportion of grand fir occupying these sites. At endemic levels, these forest insects play an important role in contributing to structural diversity, and providing dead wood habitat important for wildlife and soil productivity. At epidemic levels, they create conditions that can lead to disturbance intensities outside the historic range.

Defoliating insects such as the spruce budworm and Douglas-fir tussock moth were historically at relatively low levels due to the lack of grand and Douglas-fir trees and lack of multi-storied stand structures. With the changes in forest composition and structure that favor these insects, there have a number of severe outbreaks in the last several decades. Impacts of the recent (1985-1992) spruce budworm outbreaks are found in the warm dry vegetation types, especially in the multi-strata stand structures. In general, the suppressed tree classes of grand fir, Douglas-fir, and spruce exhibit poor crowns, reduced growth and varying degrees of mortality because of past repeated defoliation.

Diseases
The primary root diseases in dry forests are Annosus and Armillaria that result in small "centers" of mortality and associated gaps in the forest canopy. These areas provided openings for understory vegetation (grasses, shrubs and seedlings) to establish and added to structural diversity. Overall levels were generally low because of the effects of fires maintaining increased abundance of species most tolerant to diseases (ponderosa pine and western larch), and increased ability of trees to ward off infections due to lower stand densities. Frequent fires also helped keep root diseases at low levels due to the promotion of soil fungi that compete with pathogenic fungi, and through beneficial effects of fire on soil nutrients and nutrient cycling.

Historically dwarf mistletoe was present in low levels throughout the dry forests of the watershed. It predisposed the occasional tree to bark beetle attack or torching by fire. Brooms created by mistletoe infections were susceptible to fire, especially brooms in the lower crown. Thus, frequent fires likely helped keep overall levels of mistletoe low due to the "fire pruning" of infected branches and through potential negative impacts of the heat and smoke on developing mistletoe plants. The primary species infected by dwarf mistletoe are ponderosa pine and Douglas-fir. Levels of mistletoe infection vary in the Dads Creek planning area with severe infections occurring in both ponderosa pine and Douglas-fir with infected overstories that are spreading the disease to susceptible understory trees.

As with insects, these forest diseases play an important role in creating structural diversity, creating a source of snags and down logs, and providing important wildlife habitat and recycling nutrients ”locked up” in trees and logs to maintain soil productivity. At severe levels, these diseases can greatly inhibit the growth of trees and old forest structure. They also provide unique wildlife habitat, such as roosting sites for grouse.

Mechanical
Wind throw of occasional trees also added structural diversity by creating small gaps in the forest canopy, facilitating establishment of understory vegetation. As in the cooler, more moist forest types, all of these disturbance agents played an important role in providing a diversity of vegetative conditions and associated habitats across the landscape.

Human
Human related disturbances (timber harvest, fire exclusion) have affected the dry forests more than the other forest types across the watershed. In the past, the most noticeable harvests focused on the removal of the larger overstory ponderosa pine.

The most noticeable feature is the absence of large ponderosa pine trees in many stands. This is particularly evident in the west side where early railroad logging occurred; there are few large trees and an abundance of young, small to medium sized trees. Another noticeable trend has been increasing proportions of shade tolerant grand fir and Douglas-fir growing in the understory. This has increased the proportion of stands with multi-strata structures.

Table V-2: Warm Dry Forest HRV and Current Structural Stages

Structural Stage	Historic Range of Variation[1]	Current Condition
Juniper Woodlands		3%
Stand Initiation (SI)	5-15%	12%
Stem Exclusion Open Canopy (SEOC)	5-20%	46%
Stem Exclusion Closed Canopy (SECC)	1-10%	1%
Understory Reinitiation (UR)	1-10%	5%
Young Forest Multi-strata (YFMS)	5-25%	20%
Old Forest Single-stratum (OFSS)	5-55%	0%
Old Forest Multi-strata (OFMS)	5-20%	13%

[1]The HRV percentages are based on professional judgment of the historical extent of structural stages. (Powell, 1998).

Cool Moist Biophysical Environment

Cool moist forests occupy approximately 874 acres (12% of the analysis area) on northerly aspects, mid elevations, and in the cooler, wetter draw bottoms throughout the watershed.

In the absence of a major disturbance (fire) cool dry and cool moist forests will develop forest vegetation dominated by grand fir, Douglas-fir, and spruce. Where frost is frequent, lodgepole pine will be the dominant species. Ponderosa pine, western white pine, western larch, and lodgepole pine are early seral species that are dependent on disturbances to maintain suitable growing conditions.

Species Compositions and Successional Relationships

Species compositions and structural characteristics of the cool moist forests were largely dependent upon the stage of succession of the stand and associated landscape as dictated by the time since the last major disturbance (namely high intensity fire). The historic species composition of the cool moist forest had higher proportions of fire tolerant early seral species (ponderosa pine, lodgepole pine, and western larch) and lesser amounts of fire intolerant species (grand fir, Engelmann spruce, and Douglas-fir) prior to European influences. The conditions that affect disturbances in the cool moist forests have not changed as substantially over time as has happened in the drier forest types, resulting in less change in the fire severity from historic times to the present.

Species composition varies depending upon the successional development stage, past disturbances, and microclimate or microsite differences. In the absence of a major disturbance such as fire, cool moist forests will develop forest vegetation dominated by grand fir, Douglas-fir, and western larch. Earlier successional stages are dominated by early seral species such as lodgepole pine, ponderosa pine, western white pine, and western larch; while later stages show increased proportions of climax species such as grand fir, Douglas-fir, or spruce (in wetter areas). Western larch increases in abundance where past disturbance created bare soil conditions and an adequate seed source was present to re-colonize the disturbed areas. Wetter and cooler areas (such as along riparian areas and headwater areas) have increased amounts of Engelmann spruce. Western white pine was likely present in greater proportions since blister rust, an exotic disease, had not been introduced.

Where frost is frequent, lodgepole pine will be the dominant species. Lodgepole pine is the primary early seral species that would initially occupy a site. In stands with a longer fire-free interval, climax species such as grand fir would become established. Stands with a short fire return interval were maintained in lodgepole pine because succession was continually reset never getting past the early seral stages.

Disturbance Processes

Cool moist forests were not as economically attractive in the past; therefore timber harvest has been at a lesser level than in the warmer and drier forests.

Fire

The historic/natural fire disturbance regime in the cool moist forest types is best characterized as a high frequency, low intensity regime overlaid with a low frequency, high intensity regime. The relatively frequent disturbances were generally low severity, ground fires which would occur every 10-50 years. Every 100 to 200 years there would be an infrequent disturbance that was generally a high severity, stand replacing fire. The extent of the fires was variable due to the topography and ranged from 200 to 2000 acres. Fire return intervals in these forest environments were on the magnitude of 50-275+ years (Agee 1993).

Tree mortality was variable, as the tree species that grow in the moist forest have both thin and thick bark, and shallow and deep roots. Western larch and ponderosa pine have thick bark on medium to large trees. Grand fir, western white pine, Engelmann spruce, and Douglas-fir have thinner bark, especially when young and are most susceptible to mortality from ground fires. The persistent branches of grand fir and Douglas-fir make them very susceptible to torching, often resulting in crown fires which kill all of the trees in a patch. The moist forests occupying the transitional areas with the dry forests experienced more frequent, low to moderate intensity fires, resulting in vegetative and structural characteristics more similar to the dry forests (see Dry Forest section).

Where seed sources are present, fires can germinate snowbrush ceanothus, creating a dense shrub field that could persist for several decades, delaying reforestation. Snowbrush adds to the diversity of vegetation and is a nitrogen fixing plant that can help replace some of the nitrogen lost through volatilization and leaching during and after a fire.

Fire is still the most influential disturbance process occurring in cool moist forests. The impact of fire suppression is much less in this forest type than in other types, due to long fire return intervals. The main effect of fire suppression over the last 70 plus years has been to increase the species diversity, allowing more fir and spruce to occupy the stands than would naturally occur.

Insects

Between the high intensity fires, other disturbance agents (such as insects and diseases) played a role in shaping stand structures and compositions across the landscape.

Defoliating insects such as western spruce budworm and Douglas-fir tussock moth occurred at endemic levels in these forest types. They caused minor damage, weakening some trees and predisposing them to subsequent attack by mountain pine beetles and fir engraver. Impacts of the recent (1985-1992) spruce budworm outbreak are widespread, especially in the multi-strata structures. In general, the suppressed tree classes of grand fir and Douglas-fir exhibit poor crowns, reduced growth, and varying degrees of mortality because of past repeated defoliation.

The current and past insect related mortality has provided significant increases in snag levels and down logs, providing increased amounts of cavity nesting species habitat. While it provides wildlife habitat, insect related mortality has also greatly increased fuel loads, and the potential for high intensity stand replacement type fire.

Fir engraver and Douglas-fir bark beetles are other common insects in the moist forests. Historically, these two insects are endemic causing low levels of mortality. Presently fir engraver activity is increasing in the project area, and causing noticeable mortality in the fir trees. Douglas-fir bark beetle activity is present in association with larger diameter, heavily mistletoe infected Douglas-fir trees. The heavy mistletoe infection stresses these trees so that they are highly susceptible to opportunistic insects such as bark beetles.

Disease

Root diseases such as Annosus and Armillaria generally infected stands at small scales (less than 1 acre). Root disease mortality centers created gaps in stands helping to develop multi-stratum structural characteristics enhancing both horizontal and vertical structural diversity. Severe levels of root disease resulted in significant tree mortality, hindering development of late structural characteristics while maintaining understory reinitiation and young forest multi- strata structural characteristics. These areas of high mortality were also at increased risk to stand replacing fires which ultimately returned stands to early seral species with greater tolerance to root diseases. Areas that escaped fires and developed large areas of suitable hosts likely showed increased levels of root diseases resulting in changes to the stand structure and composition as levels of root disease intensified.

Other diseases such as gall rust and atropellis canker occurred as they do today, affecting lodgepole growing in humid areas, resulting in stem malformation and subsequent breakage, adding to the diversity of tree forms within stands. Dwarf mistletoe, a parasitic plant, was another disease present throughout these forest types. Lodgepole mistletoe was likely present at low levels since infected trees were generally highly susceptible to fire. Stand replacing fires also sanitized stands of mistletoe infected trees, keeping mistletoe levels low across the landscape.

Mechanical

Wind throw and breakage of occasional trees also added structural diversity by creating small gaps in the forest canopy allowing the "release" of understory vegetation. Wind related disturbance was also important in recruiting habitat logs to the forest floor and creation of live snags where tops were broken out, but the tree remained alive.

Human

Fire exclusion, sheep and cattle grazing, and past harvest activities have also changed the condition of the cool forests. These human disturbances have affected the structural character, patch size, and species compositional across the watershed. In general, human disturbance has reduced large tree structures, reduced patch sizes, increased fragmentation, and reduced the proportions of fire tolerant species.

Table V-3: Cool Moist Forest HRV and Current Structural Stages

Structural Stage	Historic Range of Variation[1]	Current Condition
Stand Initiation (SI)	1-10%	1%
Stem Exclusion Open Canopy (SEOC)	0-5%	1%
Stem Exclusion Closed Canopy (SECC)	5-25%	2%
Understory Reinitiation (UR)	5-25%	5%
Young Forest Multi-strata (YFMS)	40-60%	37%
Old Forest Single-stratum (OFSS)	0-5%	0%
Old Forest Multi-strata (OFMS)	10-30%	54%

[1]The HRV percentages are based on professional judgment of the historical extent of structural stages. (Powell, 1998).

Aspen Stands

Aspen is found in one location within the project area. It is a unique habitat that is currently much reduced from its historical extent. It is felt that the combination of fire suppression, heavy grazing by both domestic and wild ungulates, and conifer encroachment has reduced the survival of aspen and a deteriorating condition of the remaining stands.

Mountain Mahogany

Mountain mahogany is found in a number of places throughout the project area. It is a unique habitat that elsewhere is much reduced from its historical extent. It has been reduced by heavy grazing by both domestic and wild ungulates and conifer encroachment, but there are still large patches on the ridgetops and surrounding dry meadows.

Environmental Consequences

Vegetative conditions within the project area are not within the Historic Range of Variability for most biophysical environments. In addition, the species composition and stand densities are changed from the historical conditions, leading to a forest that is less resilient to natural disturbances.

Alternative 1 – No Action

Direct and Indirect Effects

Introduction

This alternative does not treat any stands by commercial harvest, pre-commercial thinning, mechanical fuel treatment, or prescribed fire.

Composition and Density

The forest is now overstocked compared with historical levels except where recent management has thinned forest stands. Along with the overstocking, there has been a large increase in the proportion of Douglas-fir and true firs in the warm dry forest types due to both past harvest that removed the early seral species of large diameter and to the exclusion of fire that would have removed most of the fire susceptible species in favor of the fire resistant species of ponderosa pine and western larch..

Structural Stages

In the warm dry biophysical environment there is currently a lack of old forest single story stand structure. The overstocked stands will result in slow growth rates, therefore the development of old forest stand structures would continue to develop at a slow rate with old forest single strata increasing from 0% to 7% and old forest multi strata from 13% to 36% in the next 50 years. Meanwhile, there is an increasing risk of large-scale, stand-replacing fires that would set back old forest development, resulting in large areas of young trees and even longer time spans to develop old forest structures. Disturbances would continue to be at a larger scale than historically occurred, with "out of scale" adverse effects to water, fish, wildlife, vegetation, and other resources. Stands would not be on track to be within the Historical Range of Variability (HRV) for stand structure for a very long time.

Since there would be no treatment with Alternative 1 to reduce overstocking or to shift the species composition, the stands would continue to become more overstocked, growth would continue to slow, and the trees would become increasingly susceptible to disturbance from insects, disease, and fire. The more crowded and dense the timber stands become over time increases the likelihood and potential severity of catastrophic disturbance events such as uncharacteristically severe wildfire. The overall resiliency to withstand natural disturbances would continue to decrease.

Table V-4: Effects of No Action on Warm Dry Forest Structural Stages

Year	SI	SEOC	SECC	UR	YFMS	OFSS	OFMS
HRV	5-15%	5-20%	1-10%	1-10%	5-25%	15-55%	5-20%
Existing	15%	46%	1%	5%	20%	0%	13%
10	15%	46%	1%	5%	20%	0%	13%
50	2%	39%	0%	0%	15%	7%	36%

Table V-5: Effects of No Action on Cool Moist Forest Structural Stages

Year	SI	SEOC	SECC	UR	YFMS	OFSS	OFMS
HRV	1-10%	0-5%	5-25%	5-25%	40-60%	0-5%	10-30%
Existing	1%	1	2%	5%	37%	0%	54%
10	1%	1%	2%	5%	37%	0%	54%
50	0%	2%	0%	0%	3%	0%	94%

Understory Vegetation

Mountain mahogany will continue to be encroached on by conifers, leading to decline in vigor and numbers. Other shrubs, which were adapted to sprout after frequent fires and need sunlight, will continue to decline as the stands become more closed. Pine grass, and other ground vegetation, will continue to decrease in vigor and forage quality with increasing shade and lack of nutrient cycling provided by burning.

Aspen

Aspen will continue to be encroached on by conifers, leading to decline in vigor and numbers. Reproduction will remain low due to the lack of fire and continued browsing by ungulates will eliminate those few suckers that do attempt to grow.

Mountain Mahogany

Mountain mahogany will continue to be encroached on by conifers, leading to decline in vigor and numbers. Reproduction will remain low due to the continued browsing by ungulates that will eliminate those few seedlings that become established.

Areas with Undeveloped Character

Most of the areas planned for mechanical treatments have previously been harvested. Old tractor skid trails and roads are found throughout the planning area. Few of the timber stands to be treated are in an unaltered condition due to the past harvesting, which mostly removed the larger and more valuable ponderosa pine.

In all areas, fire suppression has allowed the ingrowth of many more trees and the conversion of some stands from early seral species like ponderosa pine to late seral species like grand fir.

Resiliency and Sustainability

The resiliency and sustainability of the forest will continue to decline and it will remain at risk to natural disturbances that have outcomes larger and more severe than happened historically. Overstocked forest stands will continue to slow in growth and decrease in vigor as stand density continues to increase. Trees will slowly increase in size, but will remain multi-storied. The bulk of the stands which will grow into old forest will be continue to be OFMS structural stage with very few growing into OFSS, continuing the imbalance compared to HRV. Late seral species will continue to increase occupancy in the mixed conifer stands. The quantity and vigor of grasses and shrubs will continue to decline due to shading and competition for nutrients and water.

Insect Risk
Risk of attack by bark beetles will increase as the trees lose vigor and are less able to pitch out the beetles. Research has determined that trees have increased susceptibility when radial tree growth is less than 10/20ths of an inch per decade. As more attacks become successful, the population increases to outbreak levels, killing and damaging larger pockets of trees.

Risk of outbreaks of defoliating insects would continue to increase as the stand composition continues to shift to more late seral species, as the late seral species like grand fir and Douglas-fir are much more susceptible to defoliating insects. Large-scale applications of insecticides are felt to be ineffective since the habitat for the insect remains and the natural populations are available to periodically reach outbreak levels (Mason 1998, Powell 1994). Widespread defoliation and mortality would increase the fuel loads greatly. The dense, slow growing stands would remain a high risk for fir engraver attacks; further increasing mortality and fuel loading.

Disease Risk
Dwarf mistletoe infections can be expected to increase as trees slow in height growth and the crowns grow closer together. Stem and root diseases would continue to spread in the host fir trees, causing increasing mortality.

Cumulative Effects

Resiliency and Sustainability

With no mechanical or prescribed fire treatments, the forested stands would remain at risk to large-scale disturbances by insects, disease, or wildfire, a legacy of the past actions. These disturbances can cross subwatershed boundaries into surrounding areas causing varying amounts of change. There would be no change to the existing condition and there would be no additional cumulative effects from this project.

The foreseeable actions listed in Appendix C would most likely still occur, including the Fuel Reduction projects along Highway 26 to the east. These projects would continue the recent trend to improve forest health and reduce the overall fire danger, but since it is physically removed from the project area it will have no noticeable effect in the Dads Creek project area.

Alternative 2 – Proposed Action

Introduction

Most treatment is planned to take place in the hot dry and the warm dry biophysical environments. All treatments are designed to enhance growth of young stands into old forest structural stages and to enhance the sustainability of the forest to have enough time to grow into the old forest stages. These are the areas that are most in need of restoration to return the forest to a more resilient and sustainable condition. The stands not treated would have the same effects as discussed for the No Action alternative.

Direct and Indirect Effects

Composition and Density

Commercial thinning in overstocked stands would enable the remaining trees to respond by increasing their crowns and roots, increasing their ability to utilize nutrients, sunlight, and water. Growth would increase and the trees would grow into old forest structural stages sooner. The increased vigor of the trees would decrease their susceptibility to disturbance from insects and disease; and lessen the likelihood and potential severity of bark beetle outbreaks and mistletoe infestation. The decreased stand density, the increase in size, and the increase in the height to the bottom of the live crown will reduce the chances of torching and the potential for catastrophic crown fires. The overall resiliency to natural disturbances would be increased.

Reducing the stand density will encourage natural regeneration to occur in the thinned stands. Observations show that when stand densities are below 50 ft^2/acre, ponderosa pine regenerates quite readily and can form another understory. Periodic prescribed fire is recommended in the future to maintain the understory to an acceptable level to maintain the historic conditions of low stocking and few ladder fuels. Fire would remove a large number of the new seedlings, while leaving scattered patches for wildlife cover.

A stand dominated by late seral species trees is planned for conversion to early seral species. The larger trees left in the stand would be retained as legacy trees to provide a degree of vertical structure. This treatment would remove many of the younger late-seral species trees from stands, retaining the early-seral species that are there, and reforesting openings with early-seral species. This will shift the species composition closer to the historic composition. The result would range in appearance from a commercial thin to a shelterwood harvest, depending on the existing stand species composition. Treated stands would be more adapted to the natural disturbances that exist, increasing the overall resiliency to natural disturbances, and would be in suitable condition for the reintroduction of fire. Resilient stands would decrease the risk that disturbance would “reset” the stands to earlier structural stages, enabling them to continue to grow into large trees. Disturbances would be closer to the historic scale of 200 to 2,000 acres.

Structural Stages

There is currently a lack of old forest stand structures due to timber harvest, fires, and other disturbances. The increased tree growth from thinning would cause the development of old forest structural stages to accelerate, allowing the thinned stands to grow into the large size classes sooner. In the warm dry biophysical environment old forest single strata is projected to increase from 0% to 37% and old forest multi strata from 13% to 22% in the next 50 years for a total of 59% in old forest stages. This is compared to the No Action alternative that only increases the percentage of old forest single strata to 7% in 50 years and old forest multi strata to 36% for a total of 43% in the old forest stages.

There is a decreased risk of large-scale disturbances such as insect defoliators or stand-replacing fires that would set back structural stage development, both for the treated stands and surrounding stands. Stands would be resilient to disturbance and would be less likely to "reset" to earlier structural stages by disturbances, enabling them to continue to grow into large trees. Disturbances would be closer to the historic scale of only small patches and clumps of trees being removed at any one time.

The stand planned for conversion to early seral species would be more resistant to insects and disease than the current late seral species, but seedlings are susceptible to fire until they are about 30 years old. After that time they would be more resistant to fire due to their thicker bark and lack of persistent lower limbs (ladder fuels). Stands treated would be growing towards the Historical Range of Variability (HRV) for stand structure.

Table V-6: Effects of Alternative 2 on Warm Dry Forest Structural Stages

Year	SI	SEOC	SECC	UR	YFMS	OFSS	OFMS
HRV	5-15%	5-20%	1-10%	1-10%	5-25%	15-55%	5-20%
Existing	15%	46%	1%	5%	20%	0%	13%
10	14%	51%	1%	6%	15%	5%	8%
50	2%	36%	0%	0%	3%	37%	22%

Table V-7: Effects of Alternative 2 on Cool Moist Forest Structural Stages

Year	SI	SEOC	SECC	UR	YFMS	OFSS	OFMS
HRV	1-10%	0-5%	5-25%	5-25%	40-60%	0-5%	10-30%
Existing	1%	1	2%	5%	37%	0%	54%
10	0%	3%	1%	5%	36%	0%	54%
50	0%	2%	0%	0%	2%	3%	93%

Understory Vegetation

Other shrubs, which were adapted to sprout after frequent fires and needing sunlight, will increase as the stands become more open. Pine grass and other ground vegetation will increase in vigor and forage quality with decreasing shade.

Riparian Vegetation

No commercial thinning or precommercial thinning is planned within riparian areas with this alternative. Prescribed fire is anticipated to burn in portions of riparian areas, generally as low intensity fire. Past experience has shown that the different moisture regime in the riparian areas moderates the fire behavior so that there are only minor effects to the riparian vegetation. Shrubs and conifers providing streamside shade are almost never affected because they do not burn with enough intensity to cause mortality.

In the outer portions of the riparian areas where the moisture regime transitions into drier conditions similar to the surrounding uplands, the result is more of a mosaic of burned and unburned areas with some shrub and small conifer mortality. This creates an opportunity for more shrubs, which were adapted to sprout after frequent fires and needing sunlight, to increase as the stands become more open.

Aspen

One small aspen stand has been located and is to be fenced to discourage browsing by ungulates. Several conifers may be felled or girdled to reduce shading. Existing trees will have reduced competition from conifers and will be able to live longer and new trees should regenerate by suckering.

Mountain Mahogany

Mountain mahogany in treated stands will have less competition from vegetation, but will continue to be browsed by ungulates that will most likely eliminate many of the seedlings that become established.

Areas with Undeveloped Character

Most of the areas planned for mechanical treatments have previously been harvested. Old tractor skid trails and roads are found throughout the planning area. Few of the timber stands to be treated are in an unaltered condition due to the past harvesting, which mostly removed the larger and more valuable ponderosa pine. In addition, fire suppression has allowed the ingrowth of many more trees and the conversion of some stands from early seral species like ponderosa pine to late seral species like grand fir. The proposed treatments are designed to allow the stands to grow into a condition that replicates past conditions more closely than the current stands.

Resiliency and Sustainability

Approximately 38% of the area diagnosed in need for mechanical treatment is proposed for tree thinning and slash treatment. Thinned ponderosa pine stands will increase in growth and vigor as the stand density is reduced. The quantity and vigor of grasses and shrubs will increase due to the reduction in shading and competition for nutrients and water. Conversion to early seral species in the mixed conifer stand will shift the species composition towards early-seral species that are more resistant to insects and diseases and are not as susceptible to fire damage and crown fires. This will allow reintroduction of fire into the stand and increase its sustainability.

Insect Risk
Thinning is prescribed in many of the ponderosa pine stands. The additional light and warmth in thinned stands is inhospitable for bark beetles, providing an immediate degree of protection to the trees. As the trees respond with increased growth over the next several decades after the thinning, their increased vigor will allow them to withstand attempted beetle attacks by successfully pitching out the invading insects. As fewer attacks are successful, the population outbreaks will decrease to low levels, reducing the amount or size of pockets of mortality. The reduction in the proportion of late-seral species will reduce the extent of defoliation by spruce budworm and Douglas-fir tussock moth (Mason 1998, Powell 1994).

The host tree species for spruce budworm, tussock moth, and fir engraved will be reduced by thinning mixed conifer stands. Experience has shown that when late seral species make up less than 25% of the stand composition, defoliation is very light with little effect to tree growth or survival. The incidence of fir engraver would also be reduced as the proportion of fir is reduced, and the remaining fir trees would be healthier and less susceptible to attacks. Stands not treated would benefit from the reduction of host species in nearby stands, which would lessen the severity and size of outbreaks.

Disease Risk
Stem and root diseases will be reduced since both the thinnings and the shelterwood cuts will reduce the primary host (late seral species). The removal of late seral species during the thinning operations will reduce the amount of trees susceptible to root diseases, eventually allowing the disease to fade to a minor role in the forest. Thinning will increase height growth rates which will allow the remaining trees to outgrow the rate of upward dwarf mistletoe infections, gradually decreasing the amount of crown infected. The increased spacing will reduce the lateral spread of mistletoe.

The risk will remain at the present high levels for both insects and diseases in the leave patches (5-15% of the treated areas). This will provide habitat diversity in the pockets of mortality but may also affect nearby trees in the treated areas.

Cumulative Effects

The area considered for cumulative effects is the Dads Creek Subwatershed and the immediately adjacent subwatersheds. The effects of past and present activities listed in Appendix C have been integrated into and described under the affected environment. The effects of planned future activities in Appendix C will be considered in this analysis and include planned fire hazard reduction along Highway 26 to the east.

Most of the effects of the planned activities on the forest vegetation are mainly local in nature with limited geographic scope. These effects have been discussed in the previous direct and indirect effects section. The major cumulative effect is the impact on the resiliency and sustainability of the forest.

Resiliency and Sustainability

Past activities in the 1990's in this subwatershed have made some positive changes in the overall forest health and sustainability. The planned actions in this alternative, in combination with the past actions, will create a matrix of treated stands over most of the subwatershed and across ownership boundaries. These treatments will be over a sufficient proportion of the landscape (approximately 1/3 to 1/2 of the project area) to effectively serve to reduce the severity and extent of wildfire and also to reduce the chance of insects and disease reaching an outbreak situation. Disturbances within treated stands are expected to be reduced in intensity and duration, as a result of better growing conditions and a more resistant species mix. Disturbances in stands not treated will be smaller in geographic scope and more within historic scales as there will be less unbroken blocks of stands in unhealthy condition.

The foreseeable future actions listed above are anticipated to further increase the overall sustainability and resiliency of the forest as a whole, especially those activities planned in nearby subwatersheds. By creating large areas of land with a matrix of treatments, the risk of large-scale disturbances will be reduced over the landscape. These disturbances can cross subwatershed boundaries into surrounding areas causing varying amounts of change; therefore, reducing risk in one area also has a beneficial effect to the surrounding areas. This alternative has the most beneficial increase in forest resiliency to disturbance by fire, insects, and disease.

Consistency with Direction and Regulations

Forest Plan

The No Action Alternative does not meet the Forest Plan direction to establish ponderosa pine (and other early seral species) in appropriate sites to increase fire, insect, and disease resiliency.

The Proposed Action Alternative (Alt. 2) meets the direction to minimize losses due to insects and disease by establishing ponderosa pine and western larch where they are appropriate. Both natural regeneration and planting are utilized to reforest the harvested areas and seed used to grow the seedlings is collected from superior trees within the seed zone and elevation band.

Regional Forester Forest Plan Amendment #2 (Eastside Screens)

All alternatives meet the direction to not decrease old forest structural stages, since no live trees over 21" are to be harvested (except for incidental trees cut for road and landing construction and for safety).

There is no regeneration harvesting in old forest structural stages. There is thinning and understory removal in some Old Forest Multi Story designed to make these stands more resilient to natural disturbances such as fire and insects. Approximately ¼ of the current Old Forest Multi Story stands will be converted to Old Forest Single Story stands, which are currently underrepresented compared to the HRV for this area. There is no net loss of old forest (LOS) structure with any of the alternatives.

The Proposed Action Alternative (Alts. 2) better meets the objective to protect existing old forest structure and to shorten the time to grow additional old forest structural stages, since thinning overstocked stands will increase growth rates and sustainability against loss to insects, disease, and fire.

Healthy Forest Restoration Act (HFRA)

HFRA, Section 102 (e), directs states that…"if the management direction in a resource management plan (Forest Plan) for an old growth stand was established before December 15, 1993, that HFRA covered projects shall fully maintain, or contribute toward the restoration of, the structure and composition of old growth stands according to the pre-fire suppression old growth conditions characteristic of the forest type, taking into account the contribution of the stand to landscape fire adaptation and watershed health, and retaining the large trees contributing to old growth structure".

To address HFRA direction a Historic Range of Variability Analysis (HRV), was completed for the Dads Ck. WUI Project. In the analysis, existing proportions of Old Forest Structure were compared to the historic range that was thought to have existed prior to settlement, based on published research, historic timber inventories, other available science, and professional judgment.

In the proposed action alternative, about 294 acres of old forest multi-stratum (OFMS) would be converted to old forest single stratum (OFSS) structure. Thinning and understory removal would increase the amount of OFSS, which is lacking. Additionally, the designated old growth enhancement treatments (noncommercial thinning in 40% of select units) will reduce the fire hazard to groups of old growth trees. These treatments are not anticipated to change the structural stage, as 60% of each stand will not have any change and will still have the existing understory. The amount of OFMS would decrease but would still be within the historical range. Forest Plan Amendment #2 allows manipulation of one type of Old Forest Structure to move stands into the Old Forest Structure stage that is deficit if this meets historical conditions. Conversion of the 294 acres to OFSS would move stand condition to an old growth condition characteristic of the forest type.

The proposed action is consistent with the requirement to retain large trees of fire-resilient species while removing mostly smaller trees. In so doing, the proposed action serves the HFRA purpose of imitating historic forest conditions in this fire-adapted ecosystem, so that future wildfires in the area may be less intense and cause less-severe impacts on both natural resources and human environmental values.

Relevant scientific information used in the analysis to describe pre-fire suppression old growth conditions and old dependent species habitat needs is cited in the Dads Creek

WUI Fuels Reduction Project Silviculture Specialist Report, and in the Wildlife Specialists Report.

Irreversible and Irretrievable Commitments

Irreversible Commitments

There are no anticipated long-term irreversible commitments of the forest vegetation since it is renewable, as long as the soil productivity is maintained. There may be short-term losses of growth related to soil compaction. Compaction is to be kept below 20% of the forest area, and the growth reduction on compacted ground is about 15%, this would result in a total maximum growth loss of approximately 3% per year of the growth potential until the compaction gradually diminished (in about 50 years).

Irretrievable Commitments

There are irretrievable commitments of the growth of forest vegetation for about 5 years on the new landings and temporary roads that are built for the logging/biomass operations. They are to be rehabilitated after use, but there will be a lag in reforestation and growth since the sites are impacted more heavily than the surrounding forestland.

There are no other known irreversible or irretrievable commitments of forest vegetation resources that would be caused by the Proposed Action.

Wildlife

Wildlife is an important component of the affected human environment, because the public places high value on this resource, and has expressed these values through many public laws, regulations, and policies that pertain to the project. External review and comments on the proposal confirmed these values.

This section of the EA summarizes existing habitat conditions for various wildlife species and the effects of the No Action and Proposed Action alternatives on these species. Additional details can be found in the "Terrestrial Wildlife Specialist Report" located in the project record and the "Biological Evaluation of Threatened, Endangered, Proposed, and Sensitive Species" in Appendix G of this EA.

Regulatory Framework

The three principle laws relevant to wildlife management are the National Forest Management Act of 1976 (NFMA), the Endangered Species Act of 1973 (ESA), and the Migratory Bird Treaty Act (MBTA) of 1918. Direction relative to wildlife follows:

- NFMA requires the Forest Service to manage fish and wildlife habitat to maintain viable populations of all native and desirable non-native wildlife species and conserve all listed threatened or endangered species populations (36CFR219.19).

- ESA requires the Forest Service to manage for the recovery of threatened and endangered species and the ecosystems upon which they depend. Forests are required to consult with the US Fish and Wildlife Service if a proposed activity may affect the population or habitat of a listed species.

- MBTA established an international framework for the protection and conservation of migratory birds. This Act makes it illegal, unless permitted by regulations, to "pursue, hunt, take, capture, purchase, deliver for shipment, ship, cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird . . ."

Forest Service Manual Direction provides additional guidance: identify and prescribe measures to prevent adverse modifications or destruction of critical habitat and other habitats essential for the conservation of endangered, threatened, and proposed species (FSM2670.31 (6)). The Forest Service Manual directs the Regional Forester to identify sensitive species for each National Forest where species viability may be a concern.

The principle policy document relevant to wildlife management on the Forest is the 1990 Malheur National Forest Land and Resource Management Plan, referred to as the Forest Plan for the remainder of this section. The Forest Plan provides standards and guidelines for management of wildlife species and habitats. Standards and guidelines are presented at the Forest level (LRMP, pp. IV-26 to IV-33) or Management Area level (LRMP pp. IV-50, IV-53, IV-56 to IV-57, IV-105 to IV-107, and IV-108). Management Areas include General Forest (MA-1), Rangeland (MA-2), Anadromous Riparian Area (MA-3B), Big Game Winter Range (MA-4A), Old Growth (MA-13) and Visual Corridors (MA-14).

The 1995 Regional Forester's Eastside Forest Plans Amendment #2 amended Forest Plans for the National Forests in Eastern Oregon and Eastern Washington, including the Malheur National Forest. Amendment # 2 established interim wildlife standards for old growth, old growth connectivity, snags, large down logs, and northern goshawks. The Regional Forester has periodically distributed letters clarifying direction in Amendment #2 (Regional Forester, October 2, 1997; October 23, 1997; June 11, 2003).

Additional management direction is provided for conservation of migratory landbirds. This direction is consolidated in the Forest Service Landbird Strategic Plan and further developed through the Partners in Flight Program. The Oregon-Washington Partners in Flight Conservation Strategy for Landbirds in the Northern Rocky Mountains of Eastern Oregon and Washington (Altman 2000) identifies priority bird species and habitats for the Blue Mountains in Oregon.

Regional Forester's Sensitive Species List (Update): On January 31, 2008, Regional Forester Linda Goodman released an updated Sensitive Species List which includes federally listed, federally proposed and sensitive species lists.

In the cover letter for the updated species list (Regional Forester Linda Goodman, January 31, 2008) the Regional Forest states that projects initiated prior to the date of this letter may use the updated sensitive species list or the list that was in effect when the project was initiated. The Responsible Official for the project has authority to decide which list to use. "Initiated" means that a signed and dated document such as a project initiation letter, scoping letter, or Federal Register Notice for the project exists. The Dads Creek WUI Project EA meets the criteria for "initiated" because the Project Initiation Letter (PIL) was signed on July 23, 2007. Therefore, this analysis will use the 2004 Regional Forester Sensitive Species List.

Analysis Methods

Effects on wildlife species and habitat have been assessed within National Forest lands in the Dads Creek project area, focusing on the effects of activities within proposed treatment units. For several wildlife species, the effects boundary has been expanded to the subwatershed level. Each wildlife section will identify the analysis boundary used in the effects analysis. The project area (7,190 acres) is primarily in the Dads Creek subwatershed, with about 115 acres in the Dixie Meadows and .4 acres in the Isham Creek subwatersheds.

The duration of effects on the wildlife resource is described according to the following terms and definitions:

- Immediate – Approximately one growing season or several months or less
- Short-term – 0 to 5years
- Mid-term – 5 to 25 years
- Long-term – 25+ years

Rather than addressing all wildlife species, the Forest Plan focuses on three categories of wildlife: management indicator species (MIS), threatened endangered and sensitive (TES) species and featured species. In addition, interest has been raised for landbirds including neotropical migratory birds. Categories and wildlife species are summarized below:

- Management Indicator Species (MIS) — species selected by the Malheur National Forest as "barometers" of species diversity, viability, and the forest ecosystem. They are monitored over time to assess how changes in forest conditions (especially from management) affect MIS populations and habitat, and thus also populations of other species with similar habitat needs. Pine marten, pileated woodpecker, and northern three-toed woodpecker represent old growth habitats. Rocky Mountain elk represent big game species. Primary cavity excavators (most woodpeckers) represent dead wood habitats. Effects to MIS species will be discussed in the Old Growth Forest, Big Game Habitat and Primary Cavity Excavator sections respectively.

- Threatened, Endangered and Sensitive (TES) Species — An endangered species is an animal or plant species listed under the Endangered Species Act that is in danger of extinction throughout all or a significant portion of its range. A threatened species is an animal or plant species listed under the Endangered Species Act that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. A sensitive species is an animal or plant species identified by the Forest Service Regional Forester for which species viability is a concern either a) because of significant current or predicted downward trend in population numbers or density, or b) because of significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution. This analysis uses the 2004 Regional Forester Sensitive Species List.

- Featured Species — The Malheur Forest Plan defines a featured species as a wildlife species of high public interest or demand. The featured species associated with the project area are northern goshawk and blue grouse. Effects to northern goshawk and blue grouse will be discussed in the Featured Species – Northern Goshawk and the Featured Species – Blue Grouse sections, respectively.

- Landbirds including Neotropical Migratory Birds (NTMB) — Landbirds, including Neotropical migratory birds, are discussed because many species are experiencing downward population trends. Discussion can be found in the section Species of Concern – Landbirds including Neotropical Migratory Birds.

Species presence/absence determinations were based on habitat presence, wildlife surveys, recorded wildlife sightings, observations made during reconnaissance, non-Forest Service databases, and status/trend and source habitat trend documented for the Interior Columbia Basin. Formal wildlife surveys were not conducted for most species. There is a high confidence level that species discussed in this document are currently present in the area.

Alternative 1, the No Action alternative, is used as a benchmark to compare and describe the differences and effects between taking no action and implementing action alternatives. The No Action alternative is designed to represent the existing condition. Resource conditions are then projected forward in time to estimate resource changes expected in the absence of the proposed management activities.

Effects on species will be determined by assessing how the No Action and Proposed Action alternatives affect the structure and function of vegetation relative to current, projected and historical distributions. Effects on habitats are discussed, with the assumption that if appropriate habitat is available for a species, then that species occupies or could occupy the habitat. This strategy is based upon science that demonstrates connections between species populations and viability and the quantity and condition of habitat at appropriate scales of analysis (Baydack et al. 1999).

Cumulative effects have been analyzed in respect to past, ongoing and foreseeable future activities listed in Appendix C. Effects were analyzed within the context of the project area (7,190 acres).

The Wildlife section is subdivided into sub-sections: Design Elements, Management Indicator Species, Old Growth Habitat, Big Game Habitat, Primary Cavity Excavators, Featured Species, Northern Goshawks and Other Raptors, Blue Grouse and Landbird Species including Neotropical Migratory Species. Sub-sections will summarize specific analysis methods.

Management Indicator Species - MIS

Management indicator species (MIS) are selected to serve as barometers for species diversity and viability. Management indicator species are monitored over time to assess the effects of management activities on their populations and habitat, and the populations of other species with similar habitat needs.

Table WL-1 lists the 12 management indicator species currently used as indicators of the Malheur National Forest, their habitat requirements, and whether or not their habitat occurs in the Analysis Area (Dads Creek Subwatershed)

Table WL-1 Management Indicator Species

MIS Species	Representing	Habitat Requirements	Habitat Present in Analysis Area
Elk	Commonly hunted Big-game Species	Forested Mountains and meadows with grasses and forbs	Yes
Pine Marten	Old Growth	Mature, mesic coniferous forests, with high structural diversity in the under story	Yes, but other than within the DOG limited in size (largest block is approx. 44 acres), and for the most part lacking sufficient large down wood.
Pileated Woodpecker	Old Growth, Primary Cavity Nester, Snags and Down Wood	Extensive areas of dense coniferous forests with tall closed canopy, high basal area and large diameter snags	Yes
Three-toed Woodpecker	Old Growth, Primary Cavity Nester, Snags and Down Wood	Higher elevation (above 4,500ft) lodgepole pine and mixed conifer forests with a lodgepole component	Yes, but very limited due to the lack of lodgepole within the project area.
Lewis' Woodpecker	Primary Cavity Nester, Snags and Down Wood	Open forests and nests in large snags in cavities created by other cavity nesters or in very soft snags	Limited, due to lack of open forests within the project area.
Red-naped Sapsucker	Primary Cavity Nester, Snags and Down Wood	Associated with riparian habitats consisting of a mixture of grasses shrubs and hard woods	Yes, but likely limited by lack of hardwoods within the riparian area.
Williamson's Sapsucker	Primary Cavity Nester, Snags and Down Wood	Mature higher-elevation coniferous forests for nesting and feeding	Yes
Downy Woodpecker	Primary Cavity Nester, Snags and Down Wood	Associated with riparian habitats consisting of a mixture of grasses shrubs and hard woods	Yes, but likely limited by lack of hardwoods within riparian areas.
Hairy Woodpecker	Primary Cavity Nester, Snags and Down Wood	Habitat generalists that prefer large trees in open park like stands along ridges	Limited, due to lack of open park like stands within the project area.
White-headed Woodpecker	Primary Cavity Nester, Snags and Down Wood	Open ponderosa pine forests with large trees and snags in large patches	Highly limited, due to lack of open park like stands within the project area.
Black-backed Woodpecker	Primary Cavity Nester, Snags and Down Wood	Forests with dead, insect-infested trees associated with large-scale disturbances such as fire or wind throw	Limited, due to lack of insect infestation and large scale disturbance within the project area.
Northern Flicker	Primary Cavity Nester, Snags and Down Wood	Habitat generalists that prefer large trees in open park like stands near meadows	Yes, because they are habitat generalists and small openings suffice for their needs.

The Forest Plan identifies a number of primary cavity excavators as Management Indicator Species for the availability and quality of dead and defective wood habitat these include: black-backed woodpecker, three-toed woodpecker, downy woodpecker, Lewis' woodpecker, white-headed woodpecker, pileated woodpecker, hairy woodpecker, northern flicker, Williamson's sapsucker, red-breasted sapsucker and yellow-bellied sapsucker (USDA Forest Service 1990, IV-32). The red-breasted and yellow-bellied sapsuckers were formerly classified with the red-naped sapsucker. Because sapsucker species have been re-classified in recent years, the red-naped sapsucker will be used as a surrogate for the red-breasted and yellow-bellied sapsuckers.

A detailed analysis of the existing condition and the expected effects on management indicator species (MIS) can be found in the Old Growth Habitat, Big Game Habitat, and Primary Cavity Excavators sections. Additional analysis on Lewis' woodpecker and red-naped sapsucker can be found in the Landbird/Neotropical Migrant Species section.

Old Growth Existing Condition

The Forest Plan identifies three Management Indicator Species (MIS) for old growth, primarily Old Forest Multiple Strata (OFMS) structured stands: pileated woodpecker, pine marten and three-toed woodpecker. In addition, the white-headed woodpecker is a good indicator of the health of Old Forest Single Stratum (OFSS). By providing old growth habitat for these species, it is assumed that habitat for old-growth obligate species will be provided as well.

The Dedicated and Replacement Old Growth network was analyzed at the project area level (7,190 acres). Existing and historic old growth levels (OFMS and OFSS) are calculated at the project area level. Future old growth was projected 10 years after treatment and 50 years after treatment. Connectivity corridors were only designated for the project area, but connect with old growth located outside the project area.

The following terms for old growth are used interchangeably throughout this section. Nuances in the vocabulary are defined throughout the section.

- Old Growth
- Late and Old structure (LOS)
- Dedicated Old Growth (DOG)
- Replacement Old Growth (ROG)
- Old Forest Multiple Strata (OFMS)
- Old Forest Single Stratum (OFSS)

Dedicated Old Growth (DOG) & Replacement Old Growth (ROG)

Forest Plan, Management Area 13 (MA-13) provides for the management of old growth through a network of DOG/ROG areas. Each DOG/ROG is specifically managed for one of two Management Indicator Species (MIS) for OFMS: pileated woodpecker or pine marten. ROG's are established to counter possible catastrophic damage or deterioration of the DOG's. Replacement areas may not have all the characteristics of old growth at the present time, but are to be managed to achieve those characteristics in the future so that when a DOG area no longer meets the needed habitat requirements, the ROG can take its place.

To maintain an even distribution of old growth across the Forest, DOG's and ROGs were designated in all biophysical environments or forest types. Attempts were made to identify some of the best habitat available, while maintaining the old growth grid system. Generally, dry forest types provide lower quality habitat for pileated woodpeckers and pine martens than moist forest types. Historically, dry forest types were maintained under a low intensity, frequent fire regime; historic stand structure was likely Old Forest Single Stratum (OFSS). Due to fire suppression, tree stocking and canopy closure are greater than they were under historic conditions. Although many of the stands in the DOG’s/ROG’s currently do not meet old growth definitions, some stands do contain habitat components that can support pileated woodpeckers and martens in the short- to mid-term.

The Forest Plan directs continued review of DOG/ROG areas, with adjustments to boundaries as appropriate, to ensure suitable levels of old growth habitat are provided for species dependent upon them and to ensure those units meet Forest Plan standards and guidelines. The Forest Plan and its corresponding Final Environmental Impact Statement identifies the process and direction to identify Replacement Old Growth (ROG) and Pileated Woodpecker Feeding Areas (PWFA) for each DOG area. MA-13 direction permits exchanging the status of DOGs and ROG's.

In addition to the DOG/ROG network, Forest-wide Standard 59 (LRMP, page IV-31) directs Forest managers to delineate areas of old growth lodgepole pine. These old growth areas are specifically managed for three-toed woodpeckers, a MIS for old growth lodgepole pine. These areas are not considered part of the MA-13 network. Since there is no pure old growth lodgepole pine stands in the project area, there will be no old growth effects. Changes in dead wood habitats could affect this species; discussions are in the Primary Cavity Excavator section.

One Dedicated Old Growth (DOG) area is located within the project area. Currently, Forest Plan standards are not being met as there is no Replacement Old Growth (ROG) or Pileated Woodpecker Feeding Area (PWFA) associated with this DOG. Table WL-2 below lists each DOG or ROG, its associated MIS, and total acres. Management requirements are described in the footnote on the next page. See Map 9 in Appendix B for locations.

Table WL-2 Dedicated Old Growth (DOG), Replacement Old Growth (ROG), and Pileated Woodpecker Feeding Area (PWFAs)

Existing Condition DOG #	Management Requirement Species	Minimum Forest Plan Requirement Acres *	DOG Acres	ROG Acres	Pileated Feeding Acres**	Total Acres
DOG 363	Pine Marten/ Pileated Woodpecker	600	235	N/A	N/A	235
ROG 363	Pine Marten/ Pileated Woodpecker	300	N/A	0	0	0
TOTAL		900	235	0	0	235

*Old-growth Management Area (MA-13) Minimum Management Requirements:
Pileated Woodpecker Areas = 300-acre DOG + 300-acre feeding area = 600 acres.
ROG's = 150-acres and can overlap with feeding areas.
Pine Marten = 160-acre DOG + 80-acre ROG = 240 acres

ROG acres also contribute towards pileated woodpecker feeding acres. "Proposed ROG Acres" and "Additional Pileated Feeding Acres" fields should total at least 300 acres for each DOG.

In the early- to mid-1990s, old growth surveys were conducted in the DOG's/ROG's. In 2005, taped pileated woodpecker calls were broadcasted. The DOG's/ROG's have periodically been visited to record presence of pileated woodpeckers, pine marten and other wildlife species.

DOG 363 – Pine Marten/Pileated Woodpecker

DOG 363 is 235 acres and currently does not meet Forest Plan standard (300 acres). This DOG is located is within the warm-dry biophysical environment. Stands are mixed conifer. Species composition consists of varying levels of ponderosa pine, Douglas-fir and grand fir. Stands do not classify as old growth; rather, they are in a mid-seral condition, primarily Young Forest Multiple Strata (YFMS) and Stem Exclusion (SE). The number of large diameter trees fall short of quantities required for Old Forest Multiple Strata (OFMS) classification. Past and ongoing insect and disease has caused tree mortality. As a result, canopy cover is reduced with about 60% of the DOG meeting canopy cover levels that provide primary or secondary habitat for pine marten or pileated woodpecker. Primary habitat for these species is stands that are OFMS with canopy closures of 60% or greater; secondary habitat is OFMS with canopy closure of 40 to 49% or YFMS with canopy closure greater than 40%. Snags exceed Forest Plan standards, estimated at about 3.2 snags per acre greater than 10 inches dbh with 2.4 snags per acre 20 inches dbh and greater. Lack of large diameter trees, abundance of down logs, and cover are likely limiting the ability of this DOG to support pine marten for denning or foraging. In 2005, taped calls solicited responses from pileated woodpeckers and foraging signs were evident; existing habitat is not considered optimum for this species.

Old Growth within the Analysis Area

Regional Forester's Eastside Forest Plans Amendment #2 (USDA 1995) amended the Forest Plan to manage late and old structure (LOS) stands within the Historic Range of Variability (HRV). Amendment #2 direction applies to LOS stands both inside and outside of the DOG/ROG network. Stands classified as Old Forest Multiple Strata (OFMS) and Old Forest Single Stratum (OFSS) would be considered LOS habitat. Refer to the Forest Vegetation section of this EA for the HRV Analysis. The subwatershed contains an incidental amount of hot dry biophysical environments, effects will be similar to the warm dry biophysical environment. Discussions will focus on effects to old growth in the warm dry biophysical environment; old growth treatments are not being proposed in any other biophysical environments.

OFMS stands exceed HRV for the warm dry biophysical environment. Currently, OFMS occurs on approximately 13% of the warm dry biophysical environments. Historically, this structural stage occurred on 5-20% of the warm dry and environments. Fire suppression has allowed young tree stocking to increase in many stands that historically were classified as OFSS. In the project area, habitat is highly fragmented due to past timber harvest.

OFSS is below HRV for the warm dry environments, primarily due to past timber harvest and fire suppression. In the analysis area, OFSS occurs on 0% of the warm dry biophysical environments. Historically, this structural stage occurred on 15-55% of the warm dry biophysical environments.

Based on HRV, current old growth conditions are more supportive of species that require high canopy cover such as the pileated woodpecker, pine marten and northern goshawk, and are barely supportive of species that use open stand conditions such as the white-headed woodpecker and flammulated owl.

Connectivity

Dedicated Old Growth habitat and late and old structure (LOS) stands are distributed throughout the analysis area. The Regional Forester's Eastside Forest Plans Amendment #2 (USDA 1995) gives direction for maintaining connectivity between LOS habitats to allow the free movement of old growth wildlife species.

Connectivity corridors should commonly have medium diameter or larger trees (9 inches DBH) and canopy closure within the upper third of site potential and be at least 400 feet wide. If stands with these conditions are not available, then the next best stands will be selected and should be managed to improve connectivity. Those stands with a high degree of ground level vegetation provide additional screening and security cover for old growth associated species as well as for wide ranging carnivores. Generally, connectivity corridors are maintained or managed at higher tree densities and canopy cover than adjacent areas to provide more security for dispersal or movement.

Approximately 908 acres of connectivity corridors have been established for the project area (see Maps in Appendix 1 of the Wildlife Specialists Report). Corridors generally meet the minimum requirements as described in Amendment #2 of the Forest Plan. In most cases, corridors were designated at the “stand level” with stand width often exceeding the minimum 400-foot width. In some cases, where suitable forest conditions do not exist, stands have been identified as connectivity habitat even though minimum canopy closure or corridor width requirements were not met. One example is where large blocks of non-forest bracket a narrow riparian area. Connectivity corridors were established for blocks of OFMS and OFSS 10 acres in size and greater.

In the Dads Creek project, collaborators expressed interest in maintaining connectivity for deer and elk movement as well. Corridors established for old growth species typically serve big game as well. Currently, connectivity corridors are expected to support the free movement of old growth associated terrestrial wildlife.

Old Growth Environmental Consequences

Alternative 1 - No Action

Direct and Indirect Effects

The No Action alternative has no direct effects on existing old growth. In the short-to mid-term, DOG's/ROG's would remain in their current condition and location. OFMS and OFSS located both inside and outside the DOG/ROG network would remain in their current condition. This alternative does not meet Forest Plan standards for DOG/ROG network and will not provide for a PWFA for this DOG. Existing stand structures and high stocking levels would persist.

In the long-term, stands would move towards old growth conditions. Table WL-3 displays the existing percentages of OFMS and OFSS and the percentages expected in 50 years if No Action is taken. Projected old growth levels are also provided for the Proposed Action alternative for comparison purposes. Under the No Action Alternative, both OFMS and OFSS would increase overtime. OFSS would develop from stands that have been thinned in the last 20 years.

Table WL-3 displays the estimated percentage changes of OFMS and OFSS for the warm dry biophysical environments.

	Warm Dry PAG	
	OFMS	**OFSS**
Historic Range of Variation	5-20%	15-55%
Existing Condition – No Action	12.9%	0%
Condition Following Proposed Action	8.1%	4.8%
No Action in 50 Years	36.4%	6.7%
Proposed Action in 50 Years	21.6%	36.5%

White-headed woodpecker habitat would not change in the short- to mid-term. OFSS would remain below HRV, limiting habitat for white-headed woodpecker and other species associated with OFSS. In the long-term (50 years), OFSS habitat would increase from 0% to 6.7% in the warm dry biophysical environments. Populations of white-headed woodpeckers would not be expected to increase, and OFSS would still remain below HRV, limiting habitat.

Habitat for pileated woodpeckers and pine martens would increase as stand density and canopy cover increases. Populations would not be expected to change in the short- to mid-term. In the long-term (50 years), OFMS habitat would increase from 12.9% to 36.4% in the warm dry biophysical environments. OFMS would exceed HRV. Populations of marten and pileated woodpecker would potentially increase.
Current and long-term connectivity between LOS is maintained by a system of connectivity corridors. With the No Action alternative, no activities would occur within existing connectivity corridors; these corridors would continue to provide for the free movement of LOS associated species in the short- to mid-term.
Fire hazard would remain high in the project area as discussed in the Fuels specialist report. Long-term maintenance and/or development of old growth and connectivity habitat could be diminished if stand development is disrupted by epidemic bark-beetle activity (likely) or severe fire effects (possible).

Alternative 2 – Proposed Action

Direct and Indirect Effects

Dedicated Old Growth (DOG) & Replacement Old Growth (ROG)

DOG 363 – Pine Marten/Pileated Woodpecker
DOG 363 has been moved to facilitate the reduction of ladder fuels and dense canopies along the boundary with Private lands. As a result, canopy cover is now at about 90% of the DOG meeting canopy cover levels that provide primary or secondary habitat for pine marten or pileated woodpecker. Approximately, 98% of this area is within OFMS, (as compared to 63% in the old location). Snags are below Forest Plan standards, estimated at about 2.68 snags per acre greater than 10 inches dbh with.7 snags per acre 20 inches dbh and greater. Lack of large diameter trees and cover are likely still limiting the ability of this DOG to support pine marten for denning or foraging. This DOG will meet Forest Plan standards in regards to size.

ROG 363 – Pine Marten/Pileated Woodpecker
ROG 363 is within the warm dry biophysical environment. The ROG is comprised of mixed conifer stands of grand fir, Douglas-fir, and ponderosa pine, with lower levels of western larch and lodgepole pine. The ROG is comprised of OFMS and SEOC structured stands. Snags are below Forest Plan standards, estimated at 1.6 snags per acre, 10 inches dbh and greater with about 0.53 snag 20 inches dbh and greater. Lack

of large diameter trees and cover are likely still limiting the ability of this DOG to support pine marten for denning or foraging. Signs of past woodpecker foraging is evident. This ROG will meet Forest Plan standards in regards to size.

PWFA 363 - Pileated Woodpecker

PWFA 363 was created within the warm dry biophysical environment and is comprised primarily of stands of ponderosa pine/Douglas-fir and mixed conifer stands. Stands are mid-seral, even-aged stands classifying as Stem Exclusion (SE). Stands are generally over-stocked, providing higher canopy levels. Snag levels and down log levels are low. Overall, snags are below Forest Plan standards, estimated at 1.6 snags per acre 10 inches dbh and greater with about 0.53 snag 20 inches dbh and greater. This PWFA will meet Forest Plan standards in regards to size.

Old Growth within the Analysis Area

Cool moist forests occupy approximately 874 acres (12% of the analysis area) on northerly aspects, mid elevations, and in the cooler, wetter draw bottoms throughout the watershed. Of these, approximately 485 acres classify as OFMS. There are no proposed activities within the cool moist biophysical environment.

In the absence of a major disturbance (fire) cool dry and cool moist forests will develop forest vegetation dominated by grand fir, Douglas-fir, and spruce. Where frost is frequent, lodgepole pine will be the dominant species. Ponderosa pine, western white pine, western larch, and lodgepole pine are early seral species that are dependent on disturbances to maintain suitable growing conditions.

OFMS stands exceed HRV for the warm dry environments. After the proposed actions OFMS would occur on approximately 8.1% of the warm dry biophysical environments. 50 years after the proposed actions OFMS would occur on approximately 21.6% of the warm dry biophysical environments. Historically, this structural stage occurred on 5-20% of the warm dry biophysical environments. OFSS is below HRV for the warm dry environments, primarily due to past timber harvest and fire suppression. In the analysis area, OFSS would occur on 4.8% of the warm dry biophysical environments after the proposed actions. 50 years after the proposed actions OFSS would occur on 36.5% of the warm biophysical environments. Historically, this structural stage occurred on 15-55% of the warm dry biophysical environments.

Shifting stands from OFMS to OFSS would reduce habitat for canopy dependent species such as pileated woodpecker and pine marten and improve habitat for species such as white-headed woodpecker and flammulated owl. Thinning and prescribed underburning is intended to reduce understory cover and open up stands, shifting stands towards historic conditions. No activities would occur in primary habitat for pileated woodpecker and pine marten.

About 300 acres or 13% of secondary habitat would be treated, degrading habitat in the units treated. Primary and secondary habitat would remain plentiful and well distributed.

The Forest's network of Dedicated Old Growth (DOG) would also continue to maintain populations of marten and pileated woodpecker.

Following treatment, many stands or forest patches would closely resemble desired conditions: a large-tree, single-layered canopy with an open, park-like understory dominated by herbaceous cover with scattered shrub cover and pine regeneration. In the short-term, stands would still not have the requisite number of large diameter trees to classify as old growth, but desired species such as the white-headed woodpecker would still be expected to respond favorably. Populations of white-headed woodpecker would not be expected to change in the short- to mid-term, and could increase in the long-term.

Snag and down logs habitat are important to old growth MIS. Harvest and prescribed burning treatments have been designed to minimize effects to these habitats. Effects to these habitats are described in the Primary Cavity Excavator section.

Construction of temporary roads would fragment mature and old growth habitat; however, roads would be decommissioned when project work is completed. Less than a 1/2 mile of temporary road would be constructed in these habitats.

Connectivity

The proposed actions, other than prescribed burning, do not occur within any stands set aside for connectivity corridors. Approximately 3.6% (32 acres) of stands set aside for connectivity corridors (908 acres) will have prescribed fire activities take place in them. Prescribed fire has the potential to clear away some of the hiding cover but has very little effect (mortality less than 5%) on larger trees or overstory. As a result of this connectivity will be largely unchanged from the existing condition. Current and long-term connectivity between LOS is maintained by a system of connectivity corridors. These corridors would continue to provide for the free movement of LOS associated species in the short- to mid-term.

Cumulative Effects

The area considered for cumulative effects is the Dads Creek subwatershed. All of the activities in Appendix C have been considered for their cumulative effects on old growth species. Past activities such as timber harvest, road construction, fire suppression and wildfire have combined to create the current old growth condition in the analysis area. HRV tables in the Forest Vegetation section reflect the effects of past activities on structural stage.

As stated previously, OFMS in the warm biophysical environments is generally within HRV; OFSS is below HRV. Since 1995, the Forest Plan as amended has directed the Malheur National Forest to conduct timber sales in a manner that moves stands towards OFMS and OFSS structural stages, and timber sales planned since that time should not have contributed to a loss of mature and old growth forest. Future thinning and burning projects listed in Appendix C would design projects to meet this direction as well. The only exception would be the proposed harvest around the Dry Soda Lookout; harvest would likely forgo old growth development in order to keep the sight views from the lookout open. Overall, projects in warm dry biophysical environments would likely shift stands towards historic conditions that tend to support OFSS habitats and species such as the white-headed woodpecker.

Shifting stands from OFMS to OFSS would reduce habitat in the short-term for canopy dependent species such as pileated woodpecker and pine marten and improve habitat for species such as white-headed woodpecker and flammulated owl. This shift in old growth type would increase, rather than decrease the wildlife species diversity. In the long term both types of old growth would increase. Cumulatively, restoring natural vegetation conditions and fire regimes would make these habitats far more self-sustaining for associated wildlife species. Overall, proposed timber management and prescribed burning would contribute positively toward the viability of species that use old growth habitats.

The Forest's network of Dedicated Old Growth (DOG's) and Replacement Old Growth (ROG's) is being managed to maintain or develop habitat for pine marten and pileated woodpeckers. Additional OFMS habitat outside the DOG/ROG network is available and currently exceeds HRV, and would also continue to provide habitat for these species.

Snag and down logs habitat are important to old growth MIS. Cumulative effects to snags and down logs are discussed in the Primary Cavity Excavator section. This project includes design features to protect snags and down logs; overall, changes in dead wood habitats would be considered incidental.

Generally, adjacent private lands have been intensively managed. In the past, these timber stands do not appear to have been managed for old growth habitat and no change in this strategy is expected. These areas are not expected to provide OFMS or OFSS habitat in the future.

Past harvest has reduced the quantity and quality of connectivity between old growth stands. Since 1993, the Forest Plan as amended has directed the Malheur National Forest to protect connectivity habitat between LOS stands. . Future thinning and burning prescriptions would be designed to maintain connectivity.

Cumulatively, management activities across the Forest are distributed sufficiently to minimize disturbance impacts at the population levels. Seasonal restrictions are applied on a project by project basis as needed.

In the short- to mid-term, the No Action alternative would not contribute to cumulative losses of old growth or connectivity habitat because stands would not be treated. In the long-term, the No Action alternative, by forgoing action, could negatively contribute to the loss of old growth and associated species if a stand-replacing event such as wildfire occurs.

In the short-term, the Proposed Action would not contribute to cumulative losses of mature and old growth habitat. In the long-term, the Proposed Action would contribute positively to cumulative effects by accelerating the development of OFSS and maintaining connectivity habitat between LOS. Therefore, proposed activities would contribute positively toward the viability of species that use these habitats.

There are no significant adverse cumulative effects to pileated woodpeckers or pine martens or their habitat from either alternative; there are positive effects to white-headed woodpeckers from OFSS development.

Big Game Habitat – Existing Condition

Rocky Mountain elk and mule deer are big game species of concern due to their high public value. Species are considered wildly distributed across the District, Forest and the Blue Mountain Region. Rocky Mountain elk are identified in the Forest Plan as a Management Indicator Species (MIS); habitat quality is evaluated in terms of forest cover, forage quality, and open road density.

The project area is divided into winter range and summer range. Winter range is primarily at lower elevations, less than 5200 feet, where forested areas are interwoven with non-forested grasslands and shrublands. The Dads Creek subwatershed includes winter range. Summer range is predominantly in mixed conifer stands above 4,600 feet in elevation, and during periods of high temperatures both deer and elk most likely utilize northern aspects and stands with high canopy closure.

Elk habitat was evaluated using the Habitat Effectiveness Index (HEI) (Thomas et al. 1988), marginal and satisfactory cover percentages, and open road densities. Big game cover was designated using stand exams, Most Similar Neighbor analysis, aerial photographs and ground reconnaissance. Cover calculations included stands smaller than 30 acres because signs of elk and deer indicated many of these stands are being used. Open road densities were calculated using the District access travel management database. Values were estimated by subwatershed and winter/summer range classification. Cover and forage estimates were projected out 10 years following treatment. Elk population data were discussed for the Beulah Big Game Management Unit from 1999 through 2006.

Big Game Populations

Major populations of Rocky Mountain elk inhabit the Blue Mountains of Oregon (Oregon Department of Fish and Wildlife 2003). Rocky Mountain elk are distributed widely across the District and within the analysis area. They are found in mountain meadows and stands of coniferous and deciduous forests during the summer. In the winter, elk move to elevations with less snow and are found in the foothills and valleys. Elk are grazers, primarily eating grasses. Lesser amounts of forbs and woody plants are also consumed. Elk are vulnerable to disturbance, displacement, and hunting pressure. High-quality habitat for elk provides effective escape and hiding cover. Further information on elk can be found in Oregon's Elk Management Plan (Oregon Department of Fish and Wildlife 2003).

Big game management on the Malheur National Forest is a cooperative effort between the Forest Service and the Oregon Department of Fish and Wildlife (ODFW) where the Forest Service manages habitat while ODFW manages populations. The agencies cooperate by managing big game according to pre-established Management Objectives (MOs) for each big game management unit. The project area is in the Northside and Beulah Big Game Management Units. Tables WL-4 and WL-5 display MOs for elk populations, bull to cow ratios, and calf to cow ratios. Annual estimates by ODFW are displayed since 1995.

Table WL-4 Management Objectives for the Beulah Big Game Management Unit.

Annual estimates, 1995-2006, are displayed for populations, bull to cow ratios and calf to cow ratios.

Year	Population	Bulls per 100 cows	Calves per 100 cows
Management Objectives	1,300	15	N/A
2008	600	23	33
2007	600	8	29
2006	600	14	45
2005	N/A	5	21
2004	600	6	22
2003	N/A	N/A	33
2002	N/A	N/A	15
2001	1,400	24	23

Table WL-5 displays Management Objectives (MOs) for the Northside Big Game Management Unit.

Annual estimates, 2001-2006, are displayed for populations, bull to cow ratios and calf to cow ratios.

Year	Population	Bulls per 100 cows	Calves per 100 cows
Management Objectives	2,000	10	N/A
2008	2,000	12	31
2007	2,000	12	25
2006	2,000	10	32
2005	2,000	7	36
2004	2,000	11	24
2003	N/A	12	18
2002	N/A	11	22
2001	2,100	15	31

Table WL-4 indicates that wintering elk populations have not met population MOs in the Beulah unit since 2001. Table WL-5 indicates that wintering elk populations have met or exceeded population MOs in the Northside unit since 2001. Elk population levels have remained stable in spite of past forest management activities until recently.

Bull to cow ratios are influenced by a number of factors including numbers of hunters, length of hunting seasons, including the rutting period in the hunting season, lack of restrictions of antler class in harvest, lack of hiding cover, and high open road densities (Schommer and Johnson 2003). Bull to cow ratios have been variable, meeting or exceeding the MO 7 of the last 12 years for the Beulah unit and 5 of the last 6 years in the Northside unit. As bull/cow ratios decline below 10 bulls/100 cows, breeding dynamics within a herd also change, and there can be a corresponding reduction in cow/calf ratios (ODFW 2003).

Calf recruitment is the number of sub-adult animals added to the population each year. Recruitment levels are expressed as the number of calves per 100 cows. ODFW does not establish MOs for calf to cow ratios because the level of recruitment necessary for population maintenance varies annually depending on the rate of adult mortality. The average number of calves needed to sustain an elk population ranges between 20 to 40 calves per 100 cows, depending on the annual adult mortality. In the Beulah Management unit, calves to cow ratios have ranged from 15 to 51. In the Northside unit, calves to cow ratios have ranged from 18 to 36.

Habitat Effectiveness Index (HEI)

Past management activities have altered cover, forage and road densities. Thomas, et al. (1988), developed the Habitat Effectiveness Index (HEI) model for estimating elk habitat effectiveness on the landscape. HEI incorporates four variables or indices: cover quality (HEc), size and spacing of cover (HEs), quality and quantity of forage (HEf) and open road density (HEr). The Forest Plan establishes minimum standards for these indices. In addition, the Forest Plan establishes minimum standards for retention of satisfactory cover (%S), marginal cover (%M), total cover (%S and M), and open road density (see Table WL-6). In summer range, forage is not considered a limiting factor; therefore, a forage value is not used in calculations.

Table WL-6 Existing HEI Values, Cover Percentages and Open Road Densities by Subwatershed and Winter/Summer Range Classification.

Subwatershed	HEc	HEs	HEf	HEr	HEcsfr (HEI)	%S	%M	Total Cover %	Open Road Density (miles per square mile)
Winter Range									
Forest Plan Standard	.40	.30	.40	.50	.50	10	10	25	2.2
Dads Creek	.57	.71	.50	.45	.55	6.3	38.8	45.1	2.4
Summer Range									
Forest Plan Standard	.30	.30	N/A	.40	.40	12	5	20	3.2
Dads Creek	.67	.55	N/A	.40	.52	22.7	43.3	66	2.9
Dads Ck. Overall	.66	.59	.50	.42	.53	18.7	43	61.7	2.7

*See above for table definitions

Table WL-6 displays existing HEI values, cover percentages, and open road densities for the Dads Creek subwatershed. Values are displayed for both winter range and summer range.

There is approximately 115 acres in the adjacent Dixie Meadows subwatershed (.005% of the 20,115.22 acre subwatershed) outside of the Dads Creek subwatershed that is included in this project. These acres were such a small percentage of the adjacent subwatershed that HEI was not run independently for the Dixie Meadows subwatershed. The Dixie Meadows subwatershed was reviewed by digital aerial photography and there is an abundance of densely forested lands within the subwatershed and the removal of these few acres are insufficient to change cover percentages or HEI values. These acres were incorporated into the HEI run for the Dads Creek subwatershed and values can be found in WL- 6. Based upon hand computed estimates, the small amount of acres would be considered incidental and would not change HEI values. All of these acres are marginal cover in nature and will be forage after project activities.

The subwatershed exceeds minimal standards for the Habitat Effectiveness Index (HEI), i.e., 0.4 for summer range and 0.5 for winter range. The Forest Plan also identifies target objectives for summer range and winter range at 0.5 and 0.6 respectively. The Forest Plan directs moving stands towards these objectives where site-specific vegetation characteristics and health provide that opportunity (LRMP Record of Decision, LRMP, Management Area-4a). In summer range, the subwatershed exceeds the desired objective. In winter range, the subwatershed is below the desired objective.

The desired objectives for HEI are probably not sustainable; the minimum standards for HEI are more appropriate. In dry biophysical environments, cover requirements (HEc, satisfactory and marginal cover percentages) may not be compatible with Historical Range of Variability (HRV). Historical conditions and fire return intervals favored large blocks of OFSS with canopy closure too low to support large blocks of satisfactory or marginal cover. Under historical conditions, cover percentages would be inherently low, probably below Forest Plan standards and guidelines. Much of the Dads Creek analysis area typifies this condition; about 83% of the analysis area is in the hot dry and warm dry biophysical environments.

Past timber harvest, fragmentation, fire suppression and natural openings have resulted in a cover/forage ratio of about 61% cover and 39% forage. Individual habitat components, i.e., satisfactory cover and open road densities do not always meet standards, but appear to be at levels that support desired populations. The following sections discuss the various habitat components in more detail.

Forage

Approximately 39% of the analysis area currently classifies as forage. For the purpose of this analysis, forage areas include areas ranging from grasslands to forested stands with less than 40% canopy cover. Forage conditions are primarily the result of timber and grazing management, fire suppression and site productivity. Overstocked forested stands tend to reduce forage; many shrub, grass and forb species are inhibited by reduced sunlight reaching the forest floor. Livestock grazing can be beneficial or detrimental to big game. Range standards are set to meet the forage needs for both livestock and big game.

Cover

Satisfactory and marginal cover is sometimes referred to as thermal cover. Deer and elk use thermal cover to moderate harsh weather conditions, i.e., to keep cooler on hot days and to keep warmer on cold days. Under thermal cover, animals need to expend less energy for thermal regulation. The Forest Plan defines satisfactory cover for elk as a stand of coniferous trees 40 or more feet tall with an average canopy closure equal to or exceeding 50% for ponderosa pine and 60% for mixed conifer. Marginal cover is defined as a stand of coniferous trees greater than 10 feet tall with an average canopy cover meeting or exceeding 40 percent. Satisfactory and marginal cover comprises 19% and 43% of the analysis area, respectively. Total cover is provided on 61% of the analysis area.

The Forest Plan recommends conducting cover calculations at the subwatershed level to better describe cover distribution. Total cover and marginal cover meet or exceed Forest Plan standards for both winter range and summer range for the subwatershed (see Table WL-6). Satisfactory cover falls below standards in winter range for the subwatershed. The low satisfactory cover levels may not be unreasonable. As discussed previously, historical conditions and fire return intervals in Dads Creek favored large blocks of OFSS with canopy closure too low to support large blocks of satisfactory or marginal cover. Under historical conditions, cover percentages would be inherently low, probably below Forest Plan standards and guidelines.

Hiding cover, also referred to as security cover, is also important to big game animals. Hiding cover provides a visual barrier between big game animals and disturbance sources. This is especially important during hunting season when big game animals alter their travel patterns to avoid humans. Hiding cover is difficult to quantify. Many stands classified as satisfactory or marginal cover also provide hiding cover. Even in non-thermal cover stands, small thickets of saplings 1 to 2 acres in size can offer security. Generally, hiding cover is more prevalent in the moist forest environments at higher elevations and less prevalent in the dry forest environments at lower elevations. Topography can also reduce sight distance. Where topography is steep and dissected by multiple ridge lines and valley bottoms, greater security is provided. Such is the case in much of the Dads Creek project area. Table WL-6 displays levels of satisfactory and marginal cover; these cover percentages provide some indication of the availability of hiding cover in the analysis area. Satisfactory cover is typically multi-storied and often provides the best elk hiding cover. Marginal cover also provides hiding cover, but cover can be much more variable or patchy.

Historically, the project area may not have had a substantial amount of hiding cover. About 84% of the area is in the warm dry biophysical environments. These environments typically do not support high densities of conifer stems for more than 40 years. In recent years, commercial and precommercial thinning in the dry biophysical environments have started shifting stands back towards more historic conditions, reducing hiding cover in size and quality. Nevertheless, hiding cover is currently believed to be at levels that exceed HRV.

During project planning, connectivity corridors were designated between late and old (LOS) structured stands to allow movement of old growth species (see Chapter 3, Old Growth Existing Condition, Connectivity Section). The goal is to manage stands in the corridors at higher canopy densities than more intensively managed stands located outside the corridors. In the Dads Creek project, collaborators expressed interest in maintaining connectivity for deer and elk movement as well. Corridors established for old growth species typically serve big game as well.

Roads

Table WL-6 displays the open road densities for the project area by subwatershed in winter and summer range. The subwatershed meets the Forest Plan standards for open road density except in winter range, which is currently at 2.4 open miles per square miles (standard = 2.2 open miles). Total cover in winter range is well above Forest Plan standards and likely helps mitigate the potential for disturbance effects.

Perhaps more important than the impacts of road densities upon elk habit use and selection is the spatial relationships of those roads. Recent studies at the Starkey

Experimental Station found a strong correlation between road activity and habitat selection (Wisdom 2005). Elk response was affected by traffic rates, amount of forest cover near roads, and the type of road (which related to traffic rates). Female elk consistently selected areas away from open roads in both spring and summer. Once the elk were farther away from roads, they were more influenced by other factors such as conditions affecting forage. When elk were unable to avoid roads and trails, subsequent studies showed that animals increased their movement rates, which can increase energy expenditures. Higher movement rates could thus reduce the animals' fat reserves and undermine general animal condition and winter survival. The Starkey research indicated that mule deer behavior seemed to be affected more by elk than by roads. Mule deer tended to avoid elk and so the deer often used areas near roads. That is, mule deer are more likely to use areas least used by elk, which means deer end up in areas near roads with the most traffic.

The Starkey research suggests the special arrangement of roads has a greater influence on elk and deer than the Forest Plan road density model suggests. The research has shown that distance bands are more accurate for estimating disturbance to elk than road density alone. This effect would gradually decrease as distance from open roads increases. About 97% of the Dads Creek project area is within 1,000 meters of an open road; i.e., only 3% of the area is further than 1,000 meters. About 80% of the area is within 500 meters of an open road; i.e., 20% of the area is further than 500 meters. The presence of open roads likely reduces the habitat effectiveness of the area.

Fawning/Calving Habitat

Optimum calving and fawning habitat include a combination of thermal cover, hiding cover, and quality forage located in close proximity to water (USDA 1979). Habitat is provided primarily within riparian areas where high quality succulent vegetation and water are readily available. Hardwood shrubs, thickets of confer saplings and seedlings, and down logs provide hiding/security cover. Typically calving and fawning habitats is located in spring/fall range where slopes are gentle, usually less than 15%.

In the project area, untreated, riparian areas at mid-elevations probably provide some of the best calving and fawning habitat, at least where open roads have not been constructed directly in the riparian areas. Typically conifer and hardwood stocking are higher and stand structure more complex than in adjacent uplands areas where trees have been thinned. Deer and elk populations in the Beulah Big Game Management Unit remain below Management Objective's; therefore, it is assumed fawning and calving habitat is not adequate.

Big Game Habitat - Environmental Consequences

Alternative 1 - No Action

Direct and Indirect Effects

In the short- to mid-term, the existing condition would be maintained in the analysis area, resulting in no change in the Habitat Effectiveness Index (HEI) for elk. HEI would remain as described in Table WL-6. The existing cover to forage ratio (61:39) would be maintained.

In the short-term, there would be no changes in cover. Total cover and marginal cover would remain in excess of Forest Plan standards for the subwatershed. Satisfactory cover would remain deficient in winter range. In the mid- to long-term (with continued fire suppression), development of multi-strata stands would create additional satisfactory and marginal cover stands, increasing both thermal and hiding cover. Long-term changes could improve HEI over time.

Forage habitats would not be affected in the short- to mid-term. The current quality and distribution of forage habitat within the analysis area would be unchanged. In the mid- to long-term, forage would decrease as tree canopies close and shade the ground.

Open road densities would be maintained at current levels as described in the Existing Condition section. Open road densities meet Forest Plan standards in except for winter range at 2.4 open miles per square mile. Cover is well in excess of Forest Plan standards for this subwatershed, mitigating the effects of elevated road density. This alternative would not result in direct effects to big game security. Implementation of this alternative would construct no new roads, but at the same time, it would do nothing to modify existing open road densities or road management. Relationships between the spatial distribution and disturbance associated with open roads and hiding cover habitat would also not change, as existing road densities and levels of use are expected to remain the same in the short-, mid- and long-term.

Increased tree stocking may increase the chance of a high severity wildfire. A fire of moderate to intense magnitude and severity could convert multi-strata cover habitat to stand initiation forage habitat in the short- and mid-term, increasing vulnerability of big game to hunting in the roaded portion of the analysis area.

Use of these habitats would not change from the way they are currently utilized by deer and elk. Table WL-7 indicates that elk populations have been below population MOs in the Beulah unit. Table WL-8 indicates that elk populations have met population MOs in the Northside unit. Elk population levels have remained stable over the last 10 years, even if below MO,s in the Beulah unit (stable at about half the MO), in spite of past forest management activities. According to Oregon Department of Fish and Wildlife agricultural damage to the east side of the Beulah unit has increased hunting pressure to curb deprivations, resulting in a reduced wintering population on the west side of the Beulah unit (ODFW, 2008).

Alternative 2 – Proposed Action

Direct and Indirect Effects

The proposed action reduces cover with negative effects to habitat effectiveness for elk, but overall HEI values would remain above minimum Forest Plan standards for all subwatersheds, both in summer and winter range. Table WL-7 displays post-treatment HEI, cover, and open road densities. FVS was used to predict post-treatment canopy cover. See Table WL-6 for existing condition comparison. The HEI model runs are in Appendix 3 of the Biological Evaluation.

The most direct effect from the Proposed Action is the reduction in satisfactory and marginal cover and the change in cover/forage distribution. Cover would be converted to lower quality cover habitat or forage depending on the treatment. In understory removal, and commercial thin units, canopy cover would drop below 40% and be classified as forage. In precommercial thinning units, only smaller trees would be removed; post-treatment classification varies by unit. Some units drop from satisfactory to marginal cover while other stands would fall out of cover. Following treatment, satisfactory and marginal cover would comprise 13.5% and 24.6% of the analysis area, respectively. Total cover is provided on approximately 38% of the analysis area.

Satisfactory cover in winter range, already below Forest Plan standards, would be further reduced. Total cover in winter range would still be above standard at 35%. A non-significant Forest Plan amendment would be required to reduce satisfactory cover below standards in winter range. In a 2003 letter to the Eastside Forests, the Regional Office provided direction encouraging Forests to use site specific Forest Plan amendments to move the landscape towards HRV (USDA, 2003).

Table WL-7 Proposed Action HEI Values, Cover Percentages and Open Road Densities by Subwatershed and Winter/Summer Range Classification.

Subwatershed	HEc	HEs	HEf	HEr	HEcsfr (HEI)	%S	%M	Total Cover %	Open Road Density (miles per square mile)
Winter Range									
Forest Plan Standard	.40	.30	.40	.50	.50	10	10	25	3.2
Dads Creek	.59	.71	.50	.47	.56	6.3	29.1	35.3	2.1
Summer Range									
Forest Plan Standard	.30	.30	N/A	.40	.40	12	5	20	3.2
Dads Creek	.70	.71	N/A	.41	.56	15.4	23	38.4	2.8
Dads Creek	.68	.70	.50	.44	.57	13.5	24.6	38.1	2.5

See definitions on page 76 for HEI table terms

Cumulative Effects

The most direct effect from the Proposed Action is the reduction in satisfactory and marginal cover and the change in cover/forage distribution. Cover would be converted to lower quality cover habitat or forage depending on the treatment. In understory removal, and commercial thin units, canopy cover would drop below 40% and be classified as forage. In precommercial thinning units, only smaller trees would be removed; post-treatment classification varies by unit. Some units drop from satisfactory to marginal cover while other stands would fall out of cover. Following treatment, satisfactory and marginal cover would comprise 13.5% and 24.6% of the analysis area, respectively. Total cover is provided on approximately 38% of the analysis area. While cover is reduced, HEI values increase due to mitigation measures, road density reduction, increase in forage, and better distribution of cover and forage.

Deer and elk are believed to use thermal cover, i.e., satisfactory and marginal cover, to reduce the effects of weather and temperature extremes and to hide from predators. It is important to note that recent research at the Starkey Experimental Station in La Grande, Oregon (Cook 1998) has raised the concern that resource managers may be overstating the importance of thermal cover on elk condition. Studies suggest that the energetic benefits of cover may be inconsequential to elk performance, and that it is forage or nutritional effects that may have the greater impact on individual animal performance. However, these studies do not dispute elk's preference for dense forest stands or the numerous studies that show elk using dense stands disproportionately to their availability. Dense conifer cover contributes to better distribution of elk across available habitat, and may be more of a disturbance/hiding cover issue than a thermal regulation issue.

The Proposed Action would cause the loss of hiding/security cover during and immediately after thinning and burning operations. The potential negative effects of removing understory trees would be reduced by the design requirement to retain unthinned patches of dense trees throughout the project area. Unthinned patches would comprise 5% to 15% of the treated area and range from 3 to 5 acres in size depending on proximity to the wildland-urban interface boundary and the density of understory trees. In units where treatment is limited to prescribed burning, losses in hiding cover would be reduced. Design measures provide limits on tree mortality (see Chapter 2). Burning occurs in a mosaic of burned and unburned patches.

Connectivity corridors established for LOS and big game would support deer and elk movement across the landscape (see map in Appendix A). Prescribed underburning and thinning would reduce understory stocking; however, design requirements would retain non-thinned patches to facilitate animal movement.

Recent results from long-term big game studies at the Starkey Project indicates that elk avoided the short-term disturbance of logging activity itself, but elk did not avoid the harvests units or the log-hauling roads during and after timber harvest. In general, the elk populations become more dispersed during and after timber harvest which suggests that elk were moving farther over larger areas to meet their needs. Elk productivity was not negatively affected by timber harvest; however, the vulnerability of elk to hunting did increase. Open landscapes and relatively flat topography make elk more visible to hunters. This would increase hunter success, but would have little effect on elk performance (weight gain, general body condition) (USDA 2006).

Thinning and burning would improve forage conditions by opening canopies and allowing more light to the forest floor. Most native grasses and forbs and many shrubs respond positively to increased light and fire. Plants tend to sprout vigorously from their roots if the above ground portions are killed by fire, although it might take 2 to 3 years for grass and forb species and 10 to 15 years for shrubs to return to their pre-fire abundance and volume. Fire can also increase nutrient content and palatability of forage, although the increased quantity of forage after a fire may be more significant than the increased quality of that forage (USDA 2000). Species that respond favorably to fire include pinegrass, elk sedge, wild rose, snowberry, ceanothus, serviceberry, chokecherry and currant.

Mountain mahogany and bitterbrush appear to be somewhat dependent on fire for long-term viability, although short-term effects can be detrimental to these plants. Fire may kill existing plants, but will prepare the necessary seedbed for regeneration. Sagebrush is also killed by fire, but seed germination can be fostered by improved seedbeds as well. The project is not intending to burn through large, expansive shrublands. Mortality/damage of smaller shrub stands and scattered individual plants would be expected. Mosaic burning would retain shrubs throughout the project area. Overbrowsing has been detrimental to existing shrubs and fire might increase abundance and vigor of many species, thus reducing the level of browsing on any individual species or plant. Ideally, landscapes would be underburned every 10 to 15 years to enhance forage quality and quantity.

Precommercial thinning and pile burning would not be conducted in riparian areas; prescribed burning would be conducted on about 78 acres in riparian acres. Treatments would potentially affect calving and fawning habitat. Design features would retain untreated patches to maintain hiding/security cover. Precommercial thinning would have a greater impact than burning, but the number of acres being treated is considered incidental. In known calving/fawning area, precommercial thinning and underburning would be prohibited from May 1st to June 30th to minimize effects. In areas not specifically identified for calving and fawning, burning crews would watch for lone deer or elk. If crews see lone animals, they would search the immediate area for calves and fawns and avoid igniting fire where young animals are discovered.

Open road densities would increase during timber sale operations as roads are opened to facilitate log haul. There would be a short-term increase in big game disturbance during operations. Seasonal restrictions in winter range would minimize effects during the most sensitive season. Disturbance is less of a concern to summer range; more of the land base is available for use. In the Canyon Creek area, the wilderness provides high quality escapement cover when accessible. Activities would likely change big game distribution, but not affect populations. Roads opened for log haul would be closed upon completion of timber work. About 2 miles of temporary roads would be constructed and then decommissioned upon completion of harvest activities. Although satisfactory cover is below the Forest Plan standard in winter range, cover in the subwatershed would remain in excess of standards, minimizing effects. Open road densities remain below Forest Plan standards helping mitigate the effects of cover loss.

Disturbance to big game is a concern in winter range. To avoid disturbing animals, no management activities would be permitted from December 1st to April 30th.

In summary, reductions in thermal and hiding cover would likely affect big game distribution, but would not be expected to affect population numbers. Although satisfactory cover is reduced below standards, total cover remains near or in excess of standards. Retention of unthinned patches in units would help mitigate losses in cover. Open road densities would remain below Forest Plan standards in all areas except winter range, reducing the potential for disturbance. Seasonal restrictions on activities would minimize disturbance in winter range. The project was designed to maintain connectivity corridors for deer and elk. Winter and summer range would continue to meet Forest Plan standards for HEI. Elk populations have remained stable during the last 10 years, meeting or exceeding ODFW Management Objectives in the Northside Unit. Elk populations have remained stable during the last 10 years, at about half of the ODFW Management Objectives in the Beulah Unit According to Oregon Department of Fish and Wildlife agricultural damage to the east side of the Beulah unit has increased hunting pressure to curb deprivations, resulting in a reduced wintering population on the west side of the Beulah unit (ODFW, 2008).Implementation of the Proposed Action would not be expected to reduce populations.

Alternative 2 reduces satisfactory cover in winter range by an incidental amount. Less than 2 acres will be treated in winter range, therefore the values of satisfactory cover in winter range did not change from existing condition (Table WL-9) and the action alterative (Table WL-10). Total cover in winter range would still be above standard at 35%. A non-significant Forest Plan amendment would be required to reduce satisfactory cover below standards in winter range. In a 2003 letter to the Eastside Forests, the Regional Office provided direction encouraging Forests to use site specific Forest Plan amendments to move the landscape towards HRV (USDA FS June 11, 2003).

The combined effects of the Dads Creek project with the effects of past, present, and reasonably foreseeable future activities would not be expected to adversely affect populations or viability of big game species within the analysis area.

Primary Cavity Excavators – Existing Condition

Primary Cavity Excavators (PCEs) depend on standing and downed wood for foraging, nesting, and roosting. These species create cavities in dead and live trees. Secondary cavity users (flying squirrels, etc.) can use cavities excavated by these species. Primary cavity nester habitat can occur in a variety of vegetative communities with various structural conditions (Thomas 1979).

The Forest Plan identifies 11 Primary Cavity Excavators (PCE) as MIS for the availability and quality of dead and defective wood habitat: black-backed woodpecker, three-toed woodpecker, Lewis' woodpecker, white-headed woodpecker, pileated woodpecker, downy woodpecker, hairy woodpecker, northern flicker, Williamson's sapsucker, red-breasted sapsucker and yellow-bellied sapsucker. Because sapsucker species have been re-classified in recent years, the red-naped sapsucker will be used as a surrogate for the red-breasted and yellow-bellied sapsuckers.

Snags and down log densities were estimated using data obtained through stand exams, Most Similar Neighbor analysis, and field reconnaissance. On average, current snag densities in the analysis area do not meet Forest Plan standards for 100% potential population levels, i.e., 2.39 snags per acre equal to or greater than 21" dbh. Existing snags average 6.8 snags per acre 10-20" dbh and 1.1 snags per acre 20" dbh and greater. Total snags may exceed the Forest Plan standard, but the large diameter snags 20" dbh and greater are deficient. Existing snags levels are primarily a result of past harvest which removed a large portion of the existing snags and large, mature trees (snag replacement trees).

Snags and down log densities were estimated using data obtained through stand exams, Most Similar Neighbor analysis, and field reconnaissance. Snags were estimated for the analysis area (i.e., three subwatersheds at 57,761 acres), focusing on the dry biophysical environments. Future snags were projected 10 years after treatment and 50 years after treatment.

Appendix 2 of the Wildlife Specialists Report includes snag distributions for the project area; existing distributions were compared to inventory distribution data in DecAID 2.0 (Mellen 2006). Data suggests that small snags are above HRV; larger snags are variable with some density classes below HRV and some classes above HRV.

Existing snag data was also compared to wildlife data in DecAID 2.0 (Mellen et al 2006). DecAID is an internet-based computer program developed as an advisory tool to help federal land managers evaluate effects of management activities on wildlife species that use dead wood habitats. The tool synthesizes published literature, research data, wildlife databases, and expert judgment and experience.

In DecAID, wildlife tolerance levels (30%, 50%, 80%) are used to describe the % of a population that utilizes a particular habitat characteristic (e.g., snag density). Essentially, the lower the tolerance level, the fewer individuals will likely use the area. For example, at the 30% tolerance level for any given species, it would be expected that 30% of a population would find suitable or usable habitat at the specified snag density. Consequently, 70% of a population would not find suitable habitat conditions at that snag density. It should not be assumed that the highest tolerance level (80% +) is always the goal for management. In many instances, historic conditions, particularly in the dry forest types did not support the density of snags at the 80% level. In the analysis area, existing snag levels correlate to the lower tolerances levels for various PCE species, primarily at the 30%-50% tolerance levels or lower.

While DecAID provides data on wildlife use of snags and down wood, it does not measure the biological potential of wildlife populations. There is no direct relationship between wildlife tolerances, snag density and size used in DecAID and snag density and size that measure potential population levels (Mellen et al. 2006). DecAID is not a viability model, and thus tolerance levels should not be interpreted as population viability “thresholds.” Rather, DecAID tolerance levels may be interpreted as three levels of “assurance”: low (30% tolerance level), moderate (50% tolerance level), and high (80% tolerance level), Mellen et al. 2006. The higher the tolerance level, the higher the “assurance” that snag habitat is being provided. Therefore, DecAID wildlife tolerance levels are only one component used to evaluate the effects of this project on dead wood habitats and associated species. This analysis also used species’ ecology, project design features, Forest Plan standards, local historic snag data and projected snag levels to analyze effects.

Regional Forester’s Eastside Forest Plans Amendment #2 prescribes standards for down logs. In the ponderosa pine types, Amendment #2 prescribes retention of 3-6 logs per acre, total lineal length of 20-40 feet, 12 inches in diameter at the small end and each log at least 6 feet in length. In the mixed conifer types, Amendment #2 prescribes 15-20 logs per acre, total lineal length of 100-140 feet.

Visual estimates of down logs were made for each of the stand exams taken. In addition, volumetric estimates of down logs were made for the examined stands. Both visual estimates and volumetric calculations of down wood indicate that most forested stands in the project area meet Forest Plan standards. Results were also compared against down log inventory data in DecAID (Mellen et al 2006). Exam plots generally indicated that the stands in the project area have more down wood than would be expected under a historic or reference condition. Past management activities, fire suppression, disease and insects could all be cause for the build up of down wood.

Pileated Woodpecker (Dryocopus pileatus)
See the Old Growth section for the ecology, habitat, and population status.

White-headed Woodpecker (Picoides albolarvatus)
See the Old Growth section for the ecology, habitat, and population status.

Three-toed Woodpecker (Picoides dorsalis) and Black-backed Woodpecker (Picoides arcticus)
See the Old Growth section for the ecology, habitat, and population status.

Lewis' Woodpecker (Melanerpes lewis)
Unlike most other woodpecker species in Oregon, Lewis' woodpecker inhabits primarily open forest and woodlands since its primary foraging strategy is fly catching. Nesting habitat consists of two distinct types in eastern Oregon: riparian areas with large cottonwoods, and fire maintained or burned old-growth ponderosa pine forests (NatureServe 2007). This species seldom excavates its own nest cavity, instead using cavities created by other woodpeckers. In burned areas, ponderosa pine snags greater than 16 inches dbh are chosen for nesting. Similar diameter cottonwood snags in riparian areas are selected (Galen 1989).

Post-fire habitats for species such as the Lewis’ woodpecker are rare in the analysis area, as discussed in the previous section. Few cottonwood trees exist and those that do exist are primarily on private lands. There is little historical data to indicate whether cottonwood ever actually occupied much of the area.

Williamson's Sapsucker (Sphyrapicus thyroideus)
In northeastern Oregon Bull et al. (1986) described this species as occurring in mature and old-growth mixed conifer forests at 3,500 - 6,500 feet elevations. Nesting occurs in both live and dead tree species comprised mainly of western larch, but also ponderosa pine, Douglas-fir, and grand fir, in trees and snags averaging 27 inches diameter at breast height with 53% of nesting occurred in grand fir forest types. A majority of foraging consisted of feeding at sapwells of western larch and Douglas-fir with diameters averaging 8.5 inches. Mature and old growth habitat is distributed across the landscape; however, large diameter snags are limited.

Red-naped Sapsucker (Sphyrapicus nuchalis)
This species, formerly a subspecies of the yellow-bellied sapsucker, is described as inhabiting riparian habitats, especially aspen, as well as pine forests (Marshall et al.

2003). This species uses riparian willow communities for foraging (Csuti et al 1997). Nest trees are most commonly aspen with heart rot, but ponderosa pine was also selected (DeGraaf 1991). Less than 1 pair per 100 acres were noted in northeast Oregon.

A small, remnant aspen stand occurs in the project area. This aspen stand is old and decadent, exhibits poor vigor, and lacks regeneration. Due to fire suppression, conifers are encroaching on this stand and competing for water and light. Heavy grazing by domestic livestock and browsing by deer and elk often inhibit hardwood regeneration. Habitats are declining for such species as red-naped sapsucker.

Hairy Woodpecker (Picoides villosus)
Suitable habitat for this species includes open stands with low basal areas along ridges, low slopes, and southerly aspects in the ponderosa pine forest types. It is more common in older forests, but readily uses burned areas and forest edges for foraging (Csuti et al 1997). In northeastern Oregon, nesting occurs primarily in ponderosa pine 10-20 inches dbh. Grand fir is not selected, but other species may be used (Bull et al. 1986). Hairy woodpeckers feed primarily in ponderosa pine stands, and will use grand fir stand types as well. Live and dead trees greater than 10 inches dbh are foraging habitat for this species. Habitat for this species is well distributed throughout the planning area.

Downy Woodpecker (Picoides pubescens)
Preferred habitat for this small woodpecker includes cottonwood and aspen stands and riparian areas, but they will use coniferous-deciduous and sometimes coniferous forests. Territories are 5-9 acres. Nesting occurs in trees and snags greater than 8 inches dbh at heights over 15 feet (Marshall et al. 2003). They forage by a variety of means such as pecking and flaking bark for insects, gleaning leaves, and flycatching (Csuti et al 1997). Potential habitat for this species is currently found in existing riparian areas and to a more limited extent in aspen stands in the planning area.

Northern Flicker (Colaptes auratus)
This species uses a wide variety of plant communities and successional stages. It prefers open habitats, and is commonly found foraging on the ground in open woodlands, meadows, fields and regeneration harvest areas (DeGaaf et al. 1991 and Csuti et al 1997). Thomas et al. (1979) report this species using all forest successional stages for foraging and young (40-79 years) to old-growth (160+ years) for reproduction. Limited reproductive use of earlier stages is due to the absence of snags that this species requires for nesting. Nesting occurs in open areas in snags with some decay. Marshall (2003) noted 71% nest trees had broken tops. Average nest tree diameter was 22” dbh and nest holes were averaged 49 feet. Flickers were seen within the project area during goshawk surveys.

For ecology, habitat and population status of the various woodpecker species, see the Wildlife BE/Specialist Report in the Project File.

Primary Cavity Excavators - Environmental Consequences

Alternative 1 - No Action

Direct and Indirect Effects

Selection of the No Action alternative would maintain existing levels of snags and downed wood in the analysis area. No activities would be implemented, so there would be no creation or loss of existing snags or downed wood. Snags would continue to be recruited and fall at existing rates. In the short- and mid-term, the number of large diameter snags would continue to be below Forest Plan standards. In the long term, continued fire suppression and multi-strata development would increase the chance of insect infestations and disease. These occurrences would potentially increase snag densities. Downed wood densities, on average, would continue to meet Forest Plan standards now and into the future. Logs would be expected to increase as existing or created snags fall.

Table WL-8 displays the average number of existing snags for the warm dry biophysical environments in the analysis area. FVS was used to project snag levels to year 50 if No Action is taken. Projected snag levels are also provided for the Proposed Action alternative for comparison purposes. Under the No Action Alternative, snags are projected to increase over time. By 2050, snag densities would be expected to exceed Forest Plan standards.

Table WL-8: Snag densities

	Snags 10-20” dbh per acre	Snags >20” dbh per acre	Total snags per acre
Forest Plan Standard	NA	2.39	2.39
Existing Condition No Action	6.8	1.1	7.9
Proposed Action in 10 Years	7.5*	1.4*	8.9*
No Action in 50 Years	12.3	2.6	14.9
Proposed Action in 50 Years	9.5*	2.1*	11.6*

*Snag estimates for Alternative 2 do not reflect the effects of retaining untreated patches in harvest units; retention of these patches of trees would continue to provide avenues for snag creation. Values would likely be higher.

In the short- to mid-term, the No Action alternative would have minimal effects on the MIS species for dead wood habitats including 10 PCE species and the pine marten. Habitat would remain unchanged in the short- and mid-term. Snag and downed wood used by these species would have the same availability, distribution, and density described in the existing condition section. Dead wood habitat would remain stable for species such as the pileated woodpecker, downy, and hairy woodpeckers, and other species identified at the beginning of the section. These habitats would continue to provide snags for foraging and nesting, as well as higher canopy closures and near ground level canopy development that provides protection from predators. Populations would remain the same.

In the long-term, disease and insects would increase foraging and nesting habitat for these species. Table WL-8 indicates that by year 50, snag levels would be expected to meet or exceed Forest Plan standards and exceed historic levels reported by Matz(2.82 snags per acre total and 1.51 greater than 21"; 1927) on the Prairie City Ranger District in 1927 in similar habitat, approximately 20 air miles south of the Dads Creek Project area (2007). Populations would likely respond positively to these increases. Although snag habitat would be expected to increase, DecAID tolerance levels would be expected to remain around the 30%-50% or lower, as described in the existing condition section. Increases in canopy could have additional benefits to pileated woodpecker and pine marten and adverse effects to white-headed woodpeckers; canopy cover effects are discussed in detail in the Old Growth Habitat section. The red-naped sapsucker, Williamson's sapsucker, and downy woodpecker could show a slight negative effect to habitat due to continued decline in aspen habitats. Deciduous habitats only comprise a small portion of the analysis area, so no changes to existing populations would be expected.

Higher fuel loads would increase the chance of a high severity wildfire within the analysis area. A fire of this magnitude and severity would more dramatically affect snag and downed wood densities; snags would be much higher than those displayed in Table WL-8. Stand replacement wildfire would benefit some species (Lewis', black-backed, northern three-toed, and hairy woodpecker, and the northern flicker) while reducing habitat for other species (pileated, white-headed, and downy woodpecker, and the red-naped and Williamson's sapsucker) less associated with fire. Increases in stand densities resulting from continued fire suppression would increase canopy densities. The growth of understory hardwood shrubs required by some PCE species would be inhibited by reduced sunlight reaching the forest floor.

Alternative 2 - Proposed Action

Direct and Indirect Effects

Today, many green timber sales are conducted differently than they were in the past. In the Dads Creek Project, snags would not be targeted for removal, although incidental snags may be lost during logging to meet operational/safety needs during logging. Project design criteria, such as retaining clumps of live trees around snags and locating landings and temporary roads where there are few or no snags, would help minimize losses. Retention of untreated patches of trees would continue to provide avenues for snag creation.

Prescribed burning would be expected to have the most effects on snags. Snags can be both lost and recruited during burning. Design features would be incorporated into burn prescriptions to minimize the effects to existing snags. This "snag exchange" may increase local woodpecker viability if fire created snag recruitment exceeds loss. Because most of the mortality would be in trees smaller than 10" dbh, most of the benefits would be to foraging habitat rather than nesting habitat. The proposed action would result in the most immediate increase in foraging habitat.

At the analysis area scale, the loss of large snags from harvest would be expected to be minor due to the number of acres being treated and the fact that snags would not be targeted for removal. Snags felled for safety during logging operations would impact 2%-10% of the existing snags in the treatment units, and less than 1% at the landscape level. Table WL-8 predicts snag densities 10 years following treatment. As suspected, the number of 10-20 inch dbh snags would increase (6.8 snags per acre to 7.5). The number of large snags would increase slightly (1.1 snags per acre to 1.4). It is believed that these snag levels are somewhat underestimated. Snag estimates do not reflect the effects of retaining untreated patches in harvest units; retention of these patches of trees would continue to provide avenues for snag creation. Snag levels would likely be higher. Although the analysis area remains below Forest Plan standards, additional level of impact would not be expected to adversely affect PCE populations in the analysis area. At the analysis area scale, the levels of snags greater than 20" dbh would be expected to be similar to historic snag levels (Matz 1927).

Table WL-8 indicates that in the long-term (50 years), snag levels would increase, although at slightly lower levels than predicted for the No Action alternative. This would be expected given proposed thinning treatments would be designed to help reduce the levels of insect and disease operating in the project area. By year 50, total snag levels would be expected to exceed Forest Plan standards; large diameter snags could be slightly deficient (2.1 snags per acre rather than 2.4), although it is believed that these values are somewhat underestimated as discussed in the previous paragraph. Snags would exceed historic levels reported by Matz (1927) and increases would better reflect levels in DecAID. Because of proposed treatments, large diameter trees would be plentiful and a portion could be converted to snags to supplement naturally-occurring levels and address any shortfall.

Forest Plan standards for green tree replacements would be met following treatments. Sufficient snag replacement trees would be available to meet future needs in all treatment units. Although snag habitat would be expected to increase, DecAID tolerance levels would be expected to remain around the 30%-50% or lower, as described in the existing condition section.

Burning activities would be conducted to ensure little or no net loss of down logs. Logs may be charred, but effects would meet Forest Plan standards that require that no more than 3 inches of the log diameter, 1.5 inches on either side of a log, be consumed. Logs would be expected to increase as existing or created snags fall.

In the short- to mid-term, the Proposed Action would have positive effects on most PCE species because of the increase in snag habitat from prescribed burning. Because most of the trees killed would be small trees, benefits would be primarily to foraging habitat. Species that would benefit include black-backed woodpecker, three-toed woodpecker, Lewis' woodpecker, white-headed woodpecker, downy woodpecker, hairy woodpecker, northern flicker, Williamson's sapsucker, and red-naped sapsucker. Black-backed and three-toed woodpeckers tend to use smaller snags for nesting, so benefits may be slightly higher for these species. Although snag habitat would be expected to increase, DecAID tolerance levels would be expected to remain around the 30%-50% or lower, as described in the existing condition section. Habitat increases would not be expected to change populations.

The Proposed Action would have a slightly negative impact to pileated woodpecker and pine marten habitat. Snag habitat for these species would increase, but treatment would also degrade (char) down log habitat and reduce cover. Effects to cover are discussed in the Old Growth section. Combined changes in cover and dead wood habitat would not be expected to affect population viability.

In the long-term, disease and insects, although reduced compared to the No Action alternative, would continue to increase foraging, nesting and denning habitat for dead wood associated species. Populations would likely respond positively to these increases.

During project operations (logging, noncommercial thinning, machine work, burning, changes in snow mobile routes) degrees of disturbance and displacement of dead wood associated species would be likely. Overall, disturbance from activities would be limited in time and place, and therefore, would not be expected to change populations of species at the landscape level.

Cumulative Effects

The area considered for cumulative effects is the Dads Creek subwatershed. All of the activities in Appendix C have been considered for their cumulative effects on species that use dead wood habitats. Past timber harvest, fire suppression, road construction, wildfire, and firewood cutting have impacted the quantity, quality, and distribution of dead wood habitats and PCE populations dependent on these habitat features across the analysis area. These activities have created the existing condition of dead wood habitats described in the existing condition section. Large snags are currently below Forest Plan standards, but densities are similar to historic snag data reported by Matz in 1927. Down logs, on average, exceed Forest Plan standards.

Past timber harvest projects were generally very intensive; focusing upon the removal of the larger, more valuable ponderosa pine, Douglas-fir, and western larch trees (green tree replacements). Likewise, merchantable snags and downed wood were also removed, burned, or otherwise disposed of. The extensive road network in the analysis area (largely a result of past harvest) has impacted snag densities by increasing accessibility of the area to firewood cutting. Firewood cutting has impacted snag habitat in close proximity to open roads. Fire suppression has resulted in dense, multi-strata stands; snag and down log densities are generally higher in these stands than less dense ponderosa pine stands.

Current trends indicate that snags and down log numbers are increasing due to reduced harvest over the past decade and increased retention levels required by Regional Forester's Eastside Forest Plans Amendment #2. In addition, the closing of roads has reduced the amount of snags cut for firewood. Any future thinning or prescribed underburning would be designed to retain a suitable snag and down wood component. Such management strategies are expected to improve habitat for cavity dependent species.

Appendix C lists additional thinning/burning projects expected in the future. The effects of these projects on snags and down wood habitat are expected to be similar to effects described for the Dads Creek project. Harvest would fell only incidental snags for safety reasons and landing/temporary road construction. Future underburning activities have the potential to both consume existing snags and downed logs and to create new snags. Design features would be included to minimize consumption of existing habitat. Overall, snags and down logs would be expected to stay about the same or increase.

In 1997 incident 029 burned approximately 161 acres within or adjacent to the analysis area. This fire created an immediate pulse of snags that provided additional snag habitat. This post-fire habitat was not salvaged and continues to provide high levels of snags and increasing down wood habitat. Snag estimates in the existing condition section reflect snag levels in those fires areas that overlap the analysis area.

Private lands typically do not provide large diameter snags. In the past, adjacent landowners have generally salvaged damaged or dying trees to capture their economic value before they decay to a level where they no longer have a market value. Timber management has favored harvest of large diameter trees because of their higher economic value; removal of overstory trees releases smaller trees that are then managed over the next harvest cycle. Public firewood cutting is expected to continue along open roads.

Cumulatively, management activities across the Forest are distributed sufficiently to minimize disturbance impacts at the population levels.

Due to the low level of effect that is expected under the No Action and Proposed Action alternatives, it is not expected that adverse cumulative effects on snag and downed wood habitat and the species that depend on these habitats would result when combined with the residual and anticipated effects of past, present, and reasonably foreseeable future activities. Future snags projections indicate a gradual increase in snags over time. Populations of species associated with dead wood habitats would be maintained.

Featured Species

Featured species are those identified in the Malheur Forest Plan as species that require special protections. The Forest Plan (IV-30 and IV-31) provides direction (standards 50-55) for the protection of habitat for these species. There is no potential effect on pronghorn antelope, bighorn sheep, sage grouse, upland sandpiper, osprey or their habitats from the proposed action. These species will not be discussed further.

Table WL-9 lists the seven featured species currently on the Malheur National Forest. The table also includes what their habitat requirements are and whether or not their habitat occurs in the Analysis area.

Table WL-9: Featured Species Habitats

Featured Species	Habitat Requirements	Habitat Present In Analysis Area
Northern Goshawk	Mature, multi-storied ponderosa pine stands, or mixed conifer stands that are dominated by ponderosa pine	Yes
Blue Grouse	Clumps of mistletoe infected Douglas fir on tops or upper slopes of ridges	Yes
Sage Grouse	Open sagebrush plains from 4000-9000 ft in elevation.	No, due to the lack of sagebrush plains within the project area
Osprey	Large dead trees suitable for nesting (30"dbh >60' in height) adjacent to or near large rivers or lakes	No, due to the lack of large dead trees and a large river or lake adjacent to the project area
Pronghorn Antelope	Open grasslands, with low sagebrush being an important component	No, due to the lack of suitable habitat within the project area
California Bighorn Sheep	Alpine-desert grasslands associated with mountains, cliffs, foot-hills, and river canyons	No, the project area does not fall with suitable habitat for Bighorn sheep
Upland Sandpiper	Covered in the TES section	No, due to the lack of suitable habitat within the project area

Northern Goshawk - Existing Condition

Goshawk is a species specifically identified in the Regional Forester's Eastside Forest Plans Amendment #2. They utilize a wide range of mature and immature forest habitat types. In general, goshawks, nest in mature and old forest stands of relatively large trees with closed canopies (>50%) and an open understory. On the Malheur National Forest, a 30-acre nest area and a 400-acre post-fledging area (PFA) are established for each territory.

One known goshawk territories exists in the project area; the Eureka gulch territory. This territory has been monitored in the past to determine use and reproduction success. In 2007, taped goshawk calls were broadcasted in habitat throughout the remainder of the project area to determine if additional habitat was being used; calls illicit a response and a juvenile was seen, the nest stand was unable to be located, therefore, no additional territories were designated. In the spring of 2008, taped goshawk calls will be broadcast in the project area again; any new nest located will be designated an area.

Effects to habitat were analyzed for the project area. Future old growth was projected 10 years after treatment and 50 years after treatment. See Old Growth Section. Effects to known goshawk territories were analyzed for Post-fledging Areas (PFAs) within the project area.

Northern Goshawks - Environmental Consequences

Alternative 1 - No Action

Direct and Indirect Effects

Under the No Action alternative, habitat for northern goshawk would increase as stand density and canopy cover increases. Populations would not be expected to change in the short- to mid-term, and could potentially increase in the long-term. See the Old Growth Section of this Chapter for additional effects on goshawks and their preferred nesting habitat.

Fire hazard would remain high in the project area as discussed in the Fuels section of this EA. Long-term development of old growth could be diminished if stand development is disrupted by epidemic bark-beetle activity (likely) or severe fire effects (possible).

Alternative 2 – Proposed Action

Direct and Indirect Effects

Under the Proposed Action alternative, there would be a reduction in nesting habitat for the northern goshawk. Thinning and prescribed underburning is intended to reduce understory cover and open up stands, shifting stands towards historic conditions. About 335 acres of secondary habitat would be treated, degrading habitat in the units treated. Primary and secondary habitat would remain plentiful; stand growth projections indicate habitat would increase in the long-term.

Construction of temporary roads would fragment mature and old growth habitat; however, roads would be decommissioned when project work is completed. Less than a 1/2 mile of temporary road would be constructed in these habitats. See the Old

Growth Section of this Chapter for additional effects on goshawks and their preferred nesting habitat.

There is no harvest or precommercial thinning planned within the PFA so there would be no alteration to foraging habitat by reducing canopy and possibly shifting prey assemblages from canopy gleaners to open forest type birds. The only project activities within the PFA will be prescribed fire; this mechanism will most likely open up the understory of the stand without reducing the overstory canopy. More open stand conditions would create foraging habitat that would permit this raptor to detect and acquire prey species more efficiently. Because goshawks will prey on primary cavity excavators, retention of dead wood habits will help improve goshawk foraging habitat. Goshawks prey on a variety of small mammal species as well. Adult goshawks foraging in the area would not likely be disturbed by project activities.

Research (Reynolds et al. 1992 and Marshal 1992) varies on conclusions as to the effects of harvest in and adjacent to nest stands and whether or not goshawks will use these stands following harvest. Several studies (Marshal 1992) have suggested that selection harvest of trees can reduce nesting; however, goshawk management recommendations by Reynolds et al. (1992) do not exclude timber harvest. Local monitoring of goshawk territories is inconclusive on this subject; some territories have remained active from year to year despite adjacent treatments. Treatment within the PFA would follow Reynold's recommendations, maximizing stand diversity to increase prey species diversity. Annual goshawk monitoring would be conducted to validate effects to nesting goshawks.

Prescribed burning could also reduce cover, but generally burning kills smaller trees and would have minimal effect on canopy cover. As with timber harvest, seasonal restriction would be applied to burning activities if nesting goshawks are identified.

Known goshawk territories would be monitored annually for goshawk activity. If active nests are identified within or immediately adjacent to the project area, management activities would be prohibited within ½ mile of the nest sites from April 1 to September 30 to avoid disturbing goshawks during the breeding season.

Proposed treatments would reduce the hazards associated with insect epidemics and stand-replacement fire. Old growth would more likely persist into the future than under the No Action alternative. Restoring natural vegetation conditions and fire regimes would make these habitats far more self-sustaining for associated wildlife species. Known goshawks territories would be maintained; seasonal restrictions would be applied as needed to minimize disturbance during the reproduction season. Primary and secondary habitat would remain plentiful; stand growth projections indicate nesting habitat would increase in the long-term. Overall, proposed timber management and prescribed burning would contribute positively toward the viability of this species.

Cumulative Effects

The area considered for cumulative effects to nesting habitat is the Dads Creek subwatershed. All of the activities in Appendix C have been considered for their cumulative effects on northern goshawk. The following discussion focuses on those past, ongoing and reasonable foreseeable future activities that may contribute adverse effects to the species or its habitat.

Nesting habitat is typically the limiting factor for goshawks. Past timber harvest reduced mature and old growth habitat preferred for nesting and fledging. Since 1993, the Forest Plan as amended has directed the Malheur National Forest to conduct timber sales in a manner that moves stands towards OFMS and OFSS structural stages, and timber sales planned since that time should not have contributed to loss of mature and old growth forest. Future thinning and burning projects listed in Appendix 4 would adhere to this management direction.

Adjacent private lands have been logged. In the past these timber stands have generally not provided nesting habitat for goshawks. These stands are not being managed for old growth conditions, and therefore are not expected to provide nesting habitat in the future.

Forage is not considered a factor limiting goshawk population viability in the area, and consequently cumulative changes to foraging habitat, whether positive or negative, would not contribute to a measurable change in goshawk populations.

Goshawks are highly sensitive to disturbance during the breeding season. When seasonal restrictions on management activities were disregarded in the past, breeding success may have been reduced. Since 1990, seasonal restrictions on activities within ½ mile have been regularly used in the vicinity of occupied nests. Known goshawk territories are to be monitored annually; if monitoring identifies occupied nesting habitat, seasonal restrictions would be applied to all management activities.

In the short- to mid-term, the No Action alternative would not contribute to cumulative losses of old growth because stands would not be treated. In the long-term, the No Action alternative, by forgoing action, could negatively contribute to the loss of old growth and associated species if a stand-replacing event such as wildfire occurs.

In the short- to mid-term, the Proposed Action would contribute to a potential reduction in nesting habitat. In the long-term, proposed treatments would reduce the hazards associated with insect epidemics and stand-replacement fire. Old growth would more likely persist into the future than under the No Action alternative. Restoring natural vegetation conditions and fire regimes would make these habitats far more self-sustaining for associated wildlife species. Known goshawks territories would be maintained; seasonal restrictions would be applied as needed to minimize disturbance during the reproduction season. Primary and secondary habitat would remain plentiful; stand growth projections indicate nesting habitat would increase in the long-term.

Cumulatively, management actions would not be expected to reduce population viability for Northern Goshawks.

Blue Grouse - Existing Condition

Blue grouse prefer coniferous forests (especially fir) with a mixture of deciduous trees and shrubs near edges, openings. Young blue grouse eat insects, while adults depend on herbaceous material, particularly needles and buds of Douglas-fir and ponderosa pine during the winter. Dense coniferous thickets of small trees, stumps, and down logs are used by blue grouse for resting and escape cover. Large conifers with dense foliage are used for roosting. Blue grouse home range size is between 1.25 and 5 acres. The blue grouse occurs in coniferous forests dominated by Douglas-fir, grand fir, and subalpine fir. These habitats occur at mid-elevations and in subalpine areas, usually associated with openings and rocky areas. Blue grouse winter in open coniferous habitats at higher elevations than those that they inhabit in the summer. The species roosts in large conifers with dense foliage, including mistletoe Douglas-fir. The Forest Plan standard for the protection of grouse habitat (IV-30, standard #50) states that projects should “Maintain grouse winter roost habitat. They use large mistletoe infected Douglas-fir trees, generally located within the upper 1/3 of slopes, as winter roosts.

Past fire suppression in the analysis area has allowed the encroachment of shade tolerant tree species to invade fire-prone habitat types, increasing stand densities. Increased stand densities throughout the analysis area have increased stress, allowing for an increased incidence of insects and disease, including dwarf mistletoe. Past wildfire has also affected winter roost habitat for this species. Personal use woodcutting reduces the number of snags (dead standing trees) adjacent to open forest roads. This activity does not affect live trees with a potential to be used by grouse; however, recently dead mistletoe-infected trees may be removed. Woodcutting generally occurs where topography is gentle and access easy; the majority of areas with roosting habitat are not accessible to woodcutters.

The current distribution and abundance of this species in the project area is unknown. Habitat has not been formally mapped for the Dads Creek subwatershed. However, Douglas-fir dominated stands comprise a portion of the project area and it can be expected that a majority of these acres are infected with some degree of mistletoe and that these infestations are providing habitat for blue grouse.

Blue Grouse - Environmental Consequences

Alternative 1 - No Action

Direct and Indirect Effects

No activities are proposed under this alternative, so there would be no direct or indirect effects on winter roost habitat for this species. Habitat conditions would remain unchanged in the short and mid term, as described in the Existing Conditions section. Over the long term, increased stand densities and related stress will result in a greater incidence of insects and disease in the analysis area. Dwarf mistletoe, one of the diseases that increases incidence with increasing stand densities, would increase throughout the analysis area. Winter roost habitat would also increase given an increase in infected Douglas-fir; gnarled limbs and dense foliage (“witches brooms”) created by this disease agent would create ideal roosting habitat for this species.

Alternative 2 – Proposed Action

Direct and Indirect Effects

Under the Proposed Action, harvest of trees potentially providing winter roost habitat would occur. As directed by the Forest Plan, design features would be incorporated into harvest prescriptions to maintain winter roost habitat. Populations of blue grouse would be maintained. During project operations (logging, noncommercial thinning, machine work, road work and use, burning, use of alternative snow mobile routes) degrees of disturbance and displacement of wildlife are likely. Seasonal restrictions in winter range for deer and elk would also reduce effects to blue grouse. Overall, disturbance from activities would be limited in time and place, and therefore, would not be expected to change populations of blue grouse at the landscape level.

Cumulative Effects

Past activities, actions, and events in the analysis area have contributed to create the existing condition of grouse winter roost habitat in the analysis area. Past harvest and thinning, fire suppression, wild fire, and personal use woodcutting have affected the quality and quantity of winter roost habitat in the analysis area. Past harvest and thinning reduced stand densities and in some cases selectively removed infected trees that would have otherwise provided potential winter roosting habitat. These activities reduced potential winter roost habitat in the analysis area. Past fire suppression in the analysis area has allowed the encroachment of shade tolerant tree species to invade fire-prone habitat types, increasing stand densities. Increased stand densities throughout the analysis area have increased stress, allowing for an increased incidence of insects and disease, including dwarf mistletoe. Past wildfire has also affected winter roost habitat for this species. Personal use woodcutting reduces the number of snags (dead standing trees) adjacent to open forest roads. This activity does not affect live trees with a potential to be used by grouse; however, recently dead mistletoe-infected trees may be removed. Woodcutting generally occurs where topography is gentle and access easy; the majority of areas with roosting habitat are not accessible to woodcutters.

Ongoing projects that are affecting winter roost habitat include personal use woodcutting. The effects of this activity are the same as those described in the past activities section above. Because design features will be incorporated in the project activities to maintain winter roost habitat there would be no direct or indirect impacts on winter roost habitat for grouse, there would be no cumulative effects on this species or winter roost habitat.

Threatened, Endangered and Sensitive (TES) Wildlife Species - Existing Condition

Table WL-10 displays the TES wildlife species that have habitat within the project area. There is no habitat present to support the presence of the peregrine falcon (*Falco perigrinus anatum*), pygmy rabbit (*Brachylagus idahoensis*), sage grouse (Centrocercus urophasianus phaios), bobolink (*Dolichonyx oryzivorus*), upland sandpiper (*Bartramia longicauda),* tricolored blackbird (*Agelaius tricolor*), or bufflehead (*Bucephala albeola*); they are not addressed in this document.

Threatened, Endangered and Sensitive (TES) Wildlife Species - Environmental Consequences

Table WL-10 - Terrestrial Wildlife Species.

Species	Scientific Name	Status*	Occurrence*	Effects Determination*
North American Lynx	Lynx canadensis	T	HD\N	NE
Gray Wolf	*Canis lupus*	E	HD\N	NE
Northern Bald Eagle	Hailaeetus leucocephalus	S	HD\N	NI
Am. Peregrine Falcon	Falco perigrinus anatum	S	HN\N	NI
California Wolverine	Gulo gulo luteus	S	HD\N	NI
Pygmy Rabbit	Brachylagus idahoensis	S	HN\N	NI
Pacific Fisher	Martes pennanti	S	HD\N	NI
Western Sage Grouse	Centrocercus urophasianus phaios	S	HN\N	NI
Gray Flycatcher	Empidonax wrightii	S	HD\N	NI
Bobolink	Dolichonyx oryzivorus	S	HN\N	NI
Upland Sandpiper	Bartramia longicauda	S	HN\N	NI
Tricolored Blackbird	Agelaius tricolor	S	HN\N	NI
Bufflehead	Bucephala albeola	S	HN\N	NI

*Definitions on next page

Status

E - Federally Endangered
T - Federally Threatened
S - Sensitive species from Regional Forester's list
C - Candidate species under Endangered Species Act

Occurrence

HD - Habitat Documented or suspected within the project area or near enough to be impacted by project activities
HN - Habitat Not within the project area or affected by its activities
D - Species Documented in general vicinity of project activities
S - Species Suspected in general vicinity of project activities
N - Species Not documented and not suspected in general vicinity of project activities

Effects Determinations

Threatened and Endangered Species

NE - No Effect
NLAA - May Effect, Not Likely to Adversely Affect
LAA - May Effect, Likely to Adversely Affect
BE - Beneficial Effect

Sensitive Species

NI - No Impact
MIIH - May Impact Individuals or Habitat, but Will Not Likely Contribute to a Trend Towards Federal Listing or Cause a Loss of Viability to the Population or Species
WIFV - Will Impact Individuals or Habitat with a Consequence that the Action May Contribute to a Trend Towards Federal Listing or Cause a Loss of Viability to the Population or Species
BI - Beneficial Impact

The determination of effects of the Dads Creek WUI Proposed Action for all endangered and threatened species and their habitats is No Effect (NE).

The determination of effects of the Dads Creek WUI Proposed Action for all sensitive species and their habitats is No Impact (NI).

RATIONALE FOR DETERMINATION OF EFFECTS:

Canada Lynx (Lynx canadensis) – Threatened

Distribution

Oregon: The Canada lynx is considered extirpated from the state of Oregon.

Malheur National Forest: The Canada lynx is not known to currently occur within the Malheur National Forest. Detections, current or historic, have not occurred on the Forest. Historically, areas immediately adjacent to National Forest System lands had recorded sightings. Unconfirmed sightings have occurred on the Forest. . In 2006 United States Fish and Wildlife Service (USFWS) determined that the Malheur National Forest is currently unoccupied by lynx.

Analysis Area: No detections or sightings of the Canada lynx have occurred in the analysis area.

Life History and Habitat

The Canada lynx typically inhabits higher elevation subalpine fir-dominated forests. Snow depth works to the advantage of this species, as it is adapted to living in deep, soft snow conditions. Prey is composed primarily of snowshoe hare, though the lynx will also prey upon other species such as the ruffed grouse, red squirrels, other leporidae species (rabbits and hares), and other rodents. Lynx typically spend much of their time associated with the early successional lodgepole pine thickets and hardwood thickets that are heavily used by snowshoe hares. Habitats with high densities of down wood material are used for denning.

Existing Habitat Condition

The project area is not within a Lynx Analysis Unit (LAU); the nearest LAU is approximately 6 miles to the south-east of the project area. The project area is not within lynx primary or secondary habitat. The project area could provide dispersal habitat; changes in vegetation will not preclude lynx dispersal if one were to pass through.

The Lynx Conservation Agreement (CA) between the U.S. Fish and Wildlife Service was revised and amended in 2005 and 2006, and the FWS Recovery Outline was issued in September 2006. The 2006 amendment to the CA identified the Malheur National Forest as not occupied based on the results of surveys conducted there as part of the National Lynx Survey. The revision to the CA concluded that the Lynx Conservation Assessment and Strategy (LCAS) (under which Lynx Analysis Units or LAUs were delineated) did not apply to habitat that was unoccupied by lynx. However, the CA amendment also states that the LCAS may provide useful information for FS managers to consider when making decisions regarding unoccupied, mapped lynx habitat. The Forest is included in “Peripheral Habitat” in the FWS Recovery Outline. In ‘peripheral areas’ the majority of historical lynx records are sporadic and generally corresponds to period following cyclic lynx population highs in Canada. There is no evidence of long-term presence or reproduction that might indicate colonization or sustained use of these areas by lynx. However, some of these peripheral areas may provide habitat enabling the successful dispersal of lynx between populations or subpopulations…”

Effects and Determination

In 2006 United States Fish and Wildlife Service (USFWS) determined that the Malheur National Forest is currently unoccupied by lynx, so there will be No Effect (NE) to the lynx or its habitat for the following reasons:

- The Canada Lynx is not currently known to occur in the affected area or District.
- The project area is not within lynx primary or secondary habitat.

As a result of the determination, the proposed action would not have an adverse cumulative effect on Canada Lynx or its habitat in the allotment when combined with the effects of past, present, and reasonably foreseeable future activities.

Gray Wolf (Canus lupis) – Endangered

The northern Rocky Mountain gray wolf was listed as endangered on June 4, 1973, and a recovery plan was released in 1987. The United States Fish and Wildlife Service proposed to establish a distinct population segment (DPS) of the gray wolf (Canis lupus) in the Northern Rocky Mountains (NRM) of the United States. The proposed NRM DPS of the gray wolf encompasses the eastern one-third of Washington and Oregon, a small part of north-central Utah, and all of Montana, Idaho and Wyoming. The wolves' minimum recovery goal was to achieve at least 30 breeding pairs and 300 individual wolves for three consecutive years. This goal was achieved in 2002, and the population has continued to grow. Consequently, effective March 28, 2008, the US Fish and Wildlife Service removed the Northern Rocky Mountain population from the federal list of Endangered and Threatened Species under the Endangered Species Act (ESA).

On July 18, 2008, a federal judge granted a preliminary injunction on the de-listing of the Northern Rocky Mountain DPS for the gray wolf (Defenders of Wildlife et. al. vs. Hall et. al. (D. Mt.) (July 18, 2008)). Endangered Species Act protections have been reinstated for the northern Rocky Mountain gray wolf pending final resolution of this matter on the merits of the case.

In Dads Creek EA, the gray wolf is analyzed as an endangered species.

Distribution

Oregon: This species is considered to be extirpated from the state of Oregon. Dispersing individuals from Idaho's experimental population have dispersed to Oregon.

Malheur National Forest: Dispersing individuals have been confirmed on the Forest. In 1999, a collared wolf (B-45-F) from the experimental, non-essential Idaho population was confirmed north of the analysis area near the Middle Fork John Day River, but was captured and returned to Idaho. Another wolf was found dead near Baker City in the spring of 2000 and another found shot in October 2000 north of Ukiah. Current flights to locate radio-collared wolves have not confirmed any evidence of wolves in Oregon. Flights occurred over the Malheur National Forest in April 2006. However, in the past 6 years large canid tracks have been seen and scat collected for analysis on the Malheur NF. It is postulated that while no denning habitat or packs of wolves have been located to present, individual wolves may be traveling through the Blue Mountains. This indicates that the three Blue Mountain Forests are probably suitable habitat for wolves. Wolves are not currently known to occur on the Malheur National Forest.

Analysis Area: No observations of the gray wolf have occurred in the analysis area.

Life History and Habitat

Wolves are a habitat generalist, occurring where sufficient prey resources and low levels of human disturbance are present. The availability of prey is the most important habitat indicator for this species. Gray wolves feed extensively upon large ungulates, including moose, Rocky Mountain elk, and mule deer. Seasonally, rodents, such as field mice, are also important prey/forage sources. Gray wolves are a pack animal. This allows the wolf to effectively hunt large ungulates. The location and seasonal movements of the prey often directly influence daily and seasonal movements of gray wolf. The greatest threat to individual gray wolves and packs is the adverse interaction between humans and wolves.

Existing Habitat Condition

The size of this area, and the close proximity to highway 26, generally would not meet the home range requirements of the gray wolf, decreasing the likelihood that wolves would create a home range in the area. Over time, wolves dispersing from the growing experimental, non-essential central Idaho wolf population could return to the Blue Mountains and establish packs. No observations of the gray wolf have occurred in the analysis area.

Effects and Determination

Wolves are limited by prey availability and are threatened by negative interactions with humans. Generally, land management activities are compatible with wolf protection and recovery, especially actions that maintain ungulate populations. Despite good populations of ungulates on the Malheur National Forest, no wolf populations currently exist and no denning habitat has been located, therefore, there will be No Effect (NE) to the gray wolf in Alternative 1 or Alternative 2.

As a result of the determination, the proposed action would not have an adverse cumulative effect on Gray Wolf or its habitat in the allotment when combined with the effects of past, present, and reasonably foreseeable future activities. Because there are no direct or indirect effects to gray wolf, there are no cumulative effects from his project.

> ***There are no other threatened or endangered species or their habitats in the analysis area.***

Bald Eagle (Haliaeetus leucocephalus) - Sensitive Species

Distribution

Oregon: The bald eagle is widely distributed throughout the state of Oregon.

Malheur National Forest: The bald eagle has been documented on the Malheur National Forest and adjacent private lands. Observations of bald eagle are seasonal in that they occur in the late fall, winter, and early spring. Bald eagles are not known to occur on the Forest during the breeding season (late spring and summer).

Analysis Area: No observations of the bald eagle have occurred in the analysis area.

Life History and Habitat

The bald eagle is a long-lived raptor species. The species is heavily associated with aquatic habitats. Fish and waterfowl make up the majority of the bald eagle diet. During the winter, bald eagles are known to feed heavily upon carrion. Nests are typically located in large trees or snags closely associated with water.

Existing Habitat Condition

Habitat for this species is limited to the Malheur River and the riparian areas of larger tributaries. Eagles roost and feed along the main stem of the John Day River, located 5.4 river miles to the southeast. It is in these locations that sufficient populations of fish and suitable perching and nesting habitat exist. Fish populations in the Dads Creek subwatershed are limiting, and would be considered insufficient to support individuals or nesting pairs during the winter and spring. Cold, snowy winters within the analysis area also preclude use by big game in most years, reducing potential forage (carrion) for bald eagle.

Effects and Determination

No known nests exist in the analysis area or surrounding subwatersheds. Sightings on the District indicate a migratory population that passes through (winters) the District, but does not initiate nesting activities on the District. The project area is located far enough from eagle concentration areas that management activities pose no threats.

For these reasons there will be No Impact (NI) to the bald eagle in Alternative 1 or Alternative 2.

As a result of the determination, the proposed action would not have an adverse cumulative effect on Bald Eagle or its habitat in the allotment when combined with the effects of past, present, and reasonably foreseeable future activities.

California Wolverine (Gulo gulo) - Sensitive Species

Distribution

Oregon: The California wolverine is found in higher elevation areas of Oregon, including the Blue Mountains. It is also suspected to occur in the Cascade Mountains.

Malheur National Forest: The presence of wolverine has been confirmed on the Malheur National Forest. Several reliable sightings, as well as a carcass of a juvenile wolverine found in the Strawberry Mountain Wilderness (south of the analysis area), indicate that this species is present on the Malheur National Forest.

Analysis Area: No observations of wolverine have been recorded in the analysis area. They are not suspected to occur in the project area due to environmental and human-caused factors, and the close proximity to Highway 26.

Life History and Habitat

This species is strongly associated with higher elevation alpine and coniferous forest habitats. The presence of avalanche chutes, boulder fields, and/or large piles of down logs are also important habitat features. Wolverine are considered a wide ranging carnivore. This species is known to travel long distances between summering and wintering areas. These movements are based largely on the acquisition of food sources, primarily carrion, though the wolverine will also hunt rodents. Individuals typically have large home ranges, ranging from 30 to over 300 square miles in size, depending upon abundance and distribution of prey sources.

Existing Habitat Condition

Potential habitat for the California wolverine is not present within the analysis area. The project area could provide dispersal habitat to wolverine; vegetation management would not preclude the dispersal use of this species. Suitable habitat is primarily located within the Strawberry Mountain Wilderness Area, to the south in cold dry and cool moist subalpine fir-dominated habitats. At lower elevations outside the wilderness area, habitat suitability declines due to environmental factors (potential vegetation, biophysical environment, etc.) and the effects of human-related disturbance associated with the road and recreational trail system and past harvest.

Effects and Determination

As potential habitat is not located within the analysis area; there will be No Impact (NI) to the wolverine.

Pacific Fisher (Martes pennanti) - Sensitive Species

Distribution

Oregon: The Pacific fisher is considered to be rare in the state of Oregon. An introduced population occurs in southwestern Oregon. It is not known to occur elsewhere in the state.

Malheur National Forest: The pacific fisher is not known to occur on the Malheur National Forest. No records exist of its presence.

Analysis Area: No observations of fisher have occurred in the Dads Creek subwatershed.

Life History and Habitat

The species generally uses lower elevation mixed conifer or hardwood habitats that have strongly developed understory vegetation. The presence of fisher is strongly associated with ground level vegetation and dead wood structure. This is likely a response to a combination of prey species preference as well as security needs for the species. Deep snow is a barrier for the species. Fisher will actively avoid areas where snow depth is high.

The fisher preys and forages on a variety of food sources. Fisher will prey on snowshoe hares, ground squirrels and other rodents, birds, and porcupines. Wild ungulate carrion is also utilized by this species.

Existing Habitat Condition

Potential habitat for the Pacific fisher may exist in the Dedicated Old Growth (DOG) portion of the analysis area. Existing research indicates that shallow snow depths, coupled with complex stand structure, high levels of down wood, and an abundance of prey are required by this species. Snow depths tend to be shallower on an annual basis in the southern portion of the analysis area, but would still likely be prohibitive to use by the fisher in the winter.

Effects and Determination

Due to the snow depth likely being prohibitive to use by fisher in the winter there will be No Impact (NI) to the pacific fisher.

> ***There are no other sensitive species or their habitat within the analysis area.***

Landbirds including Neotropical Migratory Birds (NTMB) - Existing Condition

Neotropical migratory birds breed in temperate North America and spend the winter primarily south of the United States-Mexico border. Of the 225 migratory birds that are known to occur in the western hemisphere, about 102 are known to breed in Oregon and about 82 are known to breed on the Malheur National Forest. They include a large group of species, including many raptors, cavity excavators, warblers and other songbirds, with diverse habitat needs spanning nearly all plant community types and successional stages. Long-term population data on many of these birds indicate downward population trends although not all species populations are declining (Sharp 1996, Saab and Rich 1997, Altman 2000, USFWS 2002). Habitat loss is considered the primary factor in decline of neotropical migratory birds.

In 2000, the Oregon-Washington Chapter of Partners in Flight published its Northern Rocky Mountains Bird Conservation Plan (Altman 2000). The Plan provides conservation recommendations for the various species of landbirds that occupy the Oregon and Washington portions of the Interior Columbia Basin. The Plan identified the following priority habitats for landbird conservation: old-growth dry forest, old-growth moist forest, riparian woodland and shrubland, and unique habitats including alpine and subalpine forests, shrub-steppe, montane meadow and aspen habitats. The Conservation Plan also identified burned old forest as a limited habitat due to fire suppression. Many of the avian species/habitats identified in the Northern Rocky Mountains Bird Conservation Plan (Altman 2000), are also addressed in the USFWS's Birds of Conservation Concern (USFWS 2002).

Table WL- 11: Neotropical Migratory Birds – Focal Species found in the Project Area by Habitat Type and Acres of Habitat

Habitat Type	Habitat Feature/Conservation Focus	Focal Species
Dry Forest Old Growth	Large patches of old forest with large trees and snags - i.e., Old Forest Single Stratum (OFSS)	White-headed woodpecker
	OFSS with interspersions grassy openings and dense thickets	Flammulated owl
	OFSS - open understory with regenerating pines	Chipping sparrow
	Patches of burned old forest	Lewis' woodpecker
Mesic Mixed Conifer Old Growth	Large snags	Vaux's swift
	Overstory canopy closure	Townsend's warbler
	Structurally divers; multi-layered	Varied thrush
	Dense shrub layer in forest openings and understory	MacGillivray's warbler
	Edges and openings created by wildfire	Olive-sided flycatcher
Riparian Shrub	Willow/alder shrub patches	Willow flycatcher
Riparian Woodland	Large snags	Lewis' woodpecker
	Canopy foliage and structure	Red-eyed vireo
	Understory foliage and structure	Veery

Table WL-11 lists only those priority habitats that are in the project area and which could be affected by project implementation. The table describes habitat type, habitat feature, and associated focal species. Existing condition and effects discussions will focus more on changes to priority habitats and less on the individual species that use these habitats. Alpine, subalpine, and post-fire habitats are either not in the project area, or are not affected by this project. Old growth was analyzed at the subwatershed or analysis area level; riparian, meadow, aspen and shrub steppe habitats were analyzed at the project area level. Short-term, mid-term and long-term definitions are defined at the beginning of the report.

The following sections describe the existing conditions of priority habitats in the analysis area. As stated previously, only those priority habitats that could be affected by this project will be discussed. While the Forest has not conducted official NTMB surveys in the project area, the Oregon Breeding Bird Atlas (Adamus et al. 2001) includes observational data for this area. Much of the data for the Malheur National Forest was obtained from local biologists and ornithologists. Most NTMB species that are expected in the project area were recorded within the atlas' hexagons for the area. Based on a review of the District's wildlife database and observations made during field reconnaissance, there is a high confidence level that species discussed in this report are currently present in the area.

Mesic Mixed Conifer Old Growth Habitat and Dependent Species

The mesic mixed conifer habitats refer to the cooler, moister mixed conifer habitats that occur at higher elevations, wetter sites, northerly aspects, and in areas where soils are mesic and well developed. These forests are generally dominated by the true fir species (grand and white fire), with Douglas fir, western larch, and occasional ponderosa pine scattered within these stands. Stand structure is generally a multi-strata habitat condition. Suppression of fire and timber harvest has resulted in the expansion of this habitat condition into much of the dry forest types described above.

Five habitat features are identified with the mesic mixed conifer habitat type. These habitat features and their associated focal species are large snags (Vaux's swift), overstory canopy closure (Townsend's warbler), structurally diverse and multi-layered canopies (varied thrush), dense shrub layer in forest openings or understory (MacGillivray's warbler), and edges and openings created by fire (olive-sided flycatcher).

The Mesic Mixed Conifer Forest type is distributed in the analysis area. All five habitat features identified in Table WL-11 are present. Concerns associated with the mesic mixed conifer habitat type, as indicated in the Strategy, include primarily the loss of late successional habitat condition that was once prevalent in this habitat type. Past harvest management has converted a portion of this habitat to an early successional condition, with substantial reductions in the habitat features identified above.

The large snag habitat feature is estimated to be below the historic level. Past harvest removed a large proportion of the snags and existing mature trees (snag replacement trees) from the area. "Dense shrub layer" habitat generally cannot be queried from the Forest GIS database because the overstory vegetation in the stand is used to classify stand structure. The shrub component within the analysis area is estimated to be below historic levels due to development of dense over-story canopies resulting from past harvest and fire suppression. Although shrub habitat is limited, species associated with this habitat feature may be present. Openings created by clear-cut removals (regeneration harvest) may mimic these habitat conditions and provide habitat for these species.

Dry Forest Old Growth Habitat and Dependent Species

The hot dry and warm dry biophysical environments refer to the dry ponderosa pine dominated habitats and the dry mixed conifer habitats, i.e., conifer stands of ponderosa pine, Douglas-fir, and/or grand fir. Over 80% of the analysis area is in the warm dry biophysical environments.

The Conservation Strategy (Altman 2000) identifies four habitat components of the dry forest types that are important to landbirds: OFSS, OFSS with patches of regenerating pines, OFSS with grassy openings and dense thickets of small trees, and burned habitats (see Table WL-11). Large-scale declines in OFSS have raised concern for such species as the white-headed woodpecker, flammulated owl, chipping sparrow, white-breasted nuthatch, pygmy nuthatch, Williamson's sapsucker, and Lewis' woodpecker. These bird species have likely suffered some of the greatest population declines and range retractions (Altman 2000).

OFSS habitat is quite deficit in the analysis area, particularly in the warm dry biophysical environments. In the analysis area, OFSS occurs on 0% of the warm dry biophysical environments. Historically, this habitat type occurred on 15-55% of the warm dry biophysical environments. Currently, Young Forest Multiple Strata (YFMS) and Understory Re-Initiation (UR) habitats with low canopy coverage (<30% canopy closure) likely provide the canopy openings, dense thickets of small trees, and regenerating pines used by flammulated owl or chipping sparrow. A query of habitat data in the Forest GIS database identified about 66 acres of potential habitat for these species. Post-fire habitats for species such as the Lewis' woodpecker are rare in the analysis area.

Riparian Woodlands and Shrublands

Riparian woodlands and shrub habitats are typified by the presence of hardwood tree and shrub species, along with associated wetland herbaceous species. Water is obviously an important component of these habitats, whether it is in the form of standing wetlands, spring and seeps, or flowing water (rivers and streams). Although these habitats generally comprise only a small portion of the landscape, they usually have a disproportionately high level of avian diversity and density when compared to surrounding upland habitats.

The Conservation Strategy (Altman 2000) identifies three habitat components within the riparian woodlands and one within the riparian shrub habitats that are important to many landbirds. They include large snags, canopy foliage cover, understory shrub cover, and dense shrub patches (see Table WL-11). In addition, the Conservation Strategy identifies aspen as unique habitats important to landbirds. In the Dads Creek area, many of these habitats are associated with riparian areas or ephemeral draws, so they are included in this section.

Within the project area, riparian woodlands and shrublands are generally associated with Category 1 streams (2.14 miles) and Category 2 streams (5.53 miles), and include segments of the Dads and Dan's creeks. Large-diameter snags remain below Forest Plan standards, limiting habitat for Lewis' woodpecker (see the Primary Cavity Excavator section). Priority hardwood habitats include cottonwood, aspen, willow and alder. All four of these components have been influenced by past management activities, including timber harvest, livestock grazing and fire suppression.

Few cottonwood trees exist and those that do exist are primarily on private lands. There is little historical data to indicate whether this species ever actually occupied much of the area. Due to the limited extent of cottonwood, this discussion will not focus on Lewis' woodpecker/cottonwood snag habitats in the riparian discussion. Effects to

Lewis' woodpecker are discussed in the Primary Cavity Excavator section and Landbird section – Dry Forest Habitats.

Vegetation along streams in the project area is highly variable. The Fisheries section describes stream shading in detail. Only a few small streams have stands of large trees with closed canopies stretching along most of their length. Most streams have a patchy distribution of forest and non-forest, open vegetation types along their length. Dense willow and alder canopies historically dominated riparian shrublands. Today, shrubs condition is variable and likely not at their maximum potential. Habitat is available for species such as the red-eyed vireo, veery, and willow flycatcher.

A small, remnant aspen stand that is approximately 1/2 acre is within the project area. This aspen stand is old and decadent, exhibit poor vigor, and lack regeneration. Due to fire suppression, conifers are encroaching on this stand and compete for water and light. Heavy grazing by domestic livestock and browsing by deer and elk often inhibit hardwood regeneration. Habitats are declining for such species as red-naped sapsucker.

Riparian conditions have likely affected such landbird species as Lewis' woodpecker, red-naped sapsucker, downy woodpecker, red-eyed vireo, willow flycatcher, veery, willow flycatcher, ash-throated flycatcher, tree swallow, house wren, Swainson's thrush, calliope hummingbird, song sparrow, spotted towhee, western wood pewee, warbling vireo, American redstart, orange-crowned warbler, and mountain chickadee. Landbird species that could benefit from improvements in riparian habitat include almost every bird species residing or migrating through Oregon.

Landbirds including Neotropical Migratory Birds (NTMB) - Environmental Consequences

Landbirds, including neotropical migratory birds (NTMB), were analyzed based on the high priority habitats identified in the Oregon-Washington Chapter of Partners in Flight, Northern Rocky Mountains Bird Conservation Plan (Altman 2000). Some neotropical migratory birds respond positively to logging, precommercial thinning and prescribed burning, while others respond negatively. The following sections summarize the effects of the project on the high priority habitats listed in Table WL-11.

Alternative 1 – No Action

Direct and Indirect Effects

Mesic Mixed Conifer Forests

With the implementation of Alternative 1, there would be no direct effects to the various neotropical migratory/landbird species inhabiting the project area. Habitat modifications would not occur, nor would individuals be directly affected, as no activities are proposed under this alternative. Habitat conditions would remain limited in the short- and mid-term as described in the existing condition section. Species distributions, densities, and overall population levels would remain relatively unchanged in the short- and mid- term.

As described in the existing condition section, habitat for the Vaux's swift, Townsend's warbler, Olive-sided flycatcher, MacGillivray's warbler, and the Varied thrush would remain unchanged.

Dry Forests

With the implementation of Alternative 1, there would be no direct effects to the various neotropical migratory/landbird species inhabiting the project area. Habitat modifications would not occur, nor would individuals be directly affected, as no activities are proposed under this alternative. Habitat conditions would remain limited in the short- and mid-term as described in the existing condition section. Species distributions, densities, and overall population levels would remain relatively unchanged in the short- and mid- term.

The quantity and quality of habitat of OFSS habitats is currently poor due to past management and other factors within the analysis area. OFSS occurs on 0% of the warm dry biophysical environments. Historically, this structural stage occurred on 15-55% of the warm dry biophysical environments. Stands thinned within the last 20 years would be expected to develop into OFSS over time. In 50 years, FVS projects that 6.7% of the warm dry biophysical environment would classify as OFSS.

Indirectly, the implementation of the No Action alternative would affect some neotropical migratory bird species in the long-term. By selecting this alternative, opportunities to create and enhance OFSS habitats for adapted species would be foregone. In 50 years, the No Action alternative would still not meet HRV for OFSS.

As described in the existing condition section, habitat for the white-headed woodpecker, flammulated owl, chipping sparrow, white-breasted nuthatch, pygmy nuthatch, Williamson's sapsucker, and Lewis' woodpecker is lacking throughout the analysis area. Habitat would increase, but would still not meet HRV in 50 years.

Riparian Woodlands and Shrublands

With the implementation of the No Action alternative, there would be no direct effects to the various neotropical migratory/landbird species that utilize riparian areas. Riparian conditions would be as described in the existing condition section. Snags would likely remain limited. Riparian cover would likely remain static or improve. Mature aspen trees would continue to decline and regeneration would be low or nonexistent. By forgoing prescribed burning, riparian areas would remain at high risk to stand replacing fire that could eliminate habitat.

Riparian conditions would continue to affect use by riparian landbird species such as Lewis' woodpecker, red-naped sapsucker, downy woodpecker, red-eyed vireo, willow flycatcher, veery, willow flycatcher, ash-throated flycatcher, tree swallow, house wren, Swainson's thrush, calliope hummingbird, song sparrow, spotted towhee, western wood pewee, warbling vireo, American redstart, orange-crowned warbler, and mountain chickadee.

Alternative 2 – Proposed Action

Direct and Indirect Effects

During project operations (logging, noncommercial thinning, machine work, road work and use, burning, use of alternative snow mobile routes) degrees of disturbance and displacement of wildlife are likely. Disturbance and displacement of wildlife away from forestry operations depends upon the season of the year and the tolerance of the species and individual. Overall, disturbance from activities would be limited in time and place, and therefore, would not be expected to change populations of species at the landscape level. The Forest Plan requires protection for raptors during the reproduction periods. Seasonal restrictions for nesting raptors would be applied in active territories for this project.

Mesic Mixed Conifer Forests

With the implementation of Alternative 2, habitat modifications would occur, and individuals may be directly affected. Habitat conditions would remain limited in the short- and mid-term as described in the existing condition section. Species distributions, densities, and overall population levels would remain relatively unchanged in the short- and mid- term.

Dry Forests

Under the Proposed Action alternative, treatments in warm dry biophysical environments would shift stands towards OFSS. Post-treatment, 3% of the warm dry biophysical environment would classify as OFSS. In 50 years, FVS projects that 6.7% of the warm dry biophysical environment would classify as OFSS. The analysis area would meet HRV for OFSS.

Following treatment, many stands or forest patches would closely resemble desired conditions: a large-tree, single-layered canopy with an open, park-like understory dominated by herbaceous cover with scattered shrub cover and pine regeneration. In the short-term, stands would still not have the requisite number of large diameter trees to classify as old growth, but desired species such as the white-headed woodpecker would still be expected to respond favorably. Design requirements would retain non-thinned patches for species such as the flammulated owl and chipping sparrow. Common flickers, pileated woodpeckers, Williamson's sapsucker, northern goshawks and hairy woodpeckers currently using young to mature ponderosa and mixed conifer stands would also be expected to continue using habitat in the project area.

Burning and thinning treatments conducted in the spring can affect landbirds during the breeding season. The effects to avian populations would be minimal due to avian ecology, the number of acres treated in any one year, the mosaic nature of burning, and the recovery rates of ground vegetation.

Temporary road construction would reduce habitat in the short-term. The Proposed Action alternative would construct 1.8 miles of temporary road. Roads would be ripped and seeded when work is completed. Conifers would likely seed in on most sites but may take 10 to 30 years to become reestablished. Acres of habitat affected would be considered incidental compared to habitat acres being treated by harvest and prescribed burning.

Restoring natural vegetation conditions and fire regimes would make dry forest habitats far more self-sustaining for priority landbird species. MIS or priority landbirds that would directly benefit from treatment include the white-headed woodpecker, flammulated owl, chipping sparrow and Lewis' woodpecker.

Riparian Woodlands and Shrublands

Precommercial thinning, pile burning and prescribed burning would not be conducted in riparian areas, i.e., Riparian Habitat Conservation Areas (RHCA's). Riparian conditions would be as described in the existing condition section. Snags would likely remain limited. Riparian cover would likely remain static or improve. By forgoing prescribed burning, riparian areas would remain at high risk to stand replacing fire that could eliminate habitat.

Riparian conditions would continue to affect use by riparian landbird species such as Lewis' woodpecker, red-naped sapsucker, downy woodpecker, red-eyed vireo, willow flycatcher, veery, willow flycatcher, ash-throated flycatcher, tree swallow, house wren, Swainson's thrush, calliope hummingbird, song sparrow, spotted towhee, western wood pewee, warbling vireo, American redstart, orange-crowned warbler, and mountain chickadee.

Shrub-steppe Habitats

Prescribed fire is not proposed in any larger expanses of open shrublands or grasslands, although a small amount of light burning may occur along the fringes of these habitats and in small inclusions scattered throughout the forested areas. In fringe areas, any shrubland areas burned would do so in a mosaic of burned and unburned patches. Unburned islands of sagebrush can retain habitat features vital to associated species, such as vesper sparrow. In studies in Idaho, (Smith 2000), prescribed burns killed about 50% of the shrubs; total bird abundance declined significantly in the first year after fire, and then rebounded in years two and three to levels similar to those in unburned areas. Scattered loss of shrubs is not expected to have significant impacts on shrub-steppe habitats or the landbird species that use them. Species such as vesper sparrow, Brewer's sparrow, lark sparrow and long-billed curlew would be expected to continue to use the area.

Cumulative Effects

The following discussion focuses on past, ongoing, and reasonable foreseeable future activities that may contribute adverse effects to landbirds and their habitats. Every action (including no action) within the scope of control of the Forest Service has tradeoffs. Past actions, including timber harvest, livestock grazing, recreation development, road construction, and fire suppression, among others, have all impacted landbird species and habitats individually and cumulatively. Past timber harvest has caused a loss of mature, open stands of Ponderosa pine throughout much of the analysis area. The quality and quantity of habitat for species dependent on these habitats (see Table WL-11) has decreased. Large tracts of open pine forest have been fragmented. Road building associated with timber harvest has reduced the quantity of habitat available to some species and led to the fragmentation of habitat. Fire suppression over the last century has resulted in the encroachment of fire intolerant species (Douglas fir, grand fir, and lodgepole pine) into biophysical environments where these species were historically uncommon. Fire suppression has impacted residual pine stands by allowing fire-intolerant tree species to compete with Ponderosa pine, and caused understories to become dense. Past harvest has reduced large snag habitats in mesic mixed conifer forests. Past grazing and fire suppression has reduced riparian shrub and aspen habitats.

Some species have benefited from past actions. Multi-layered habitats have increase due to fire suppression. Past-fires and regeneration harvesting has created patches of burned old forest, and edge and opening habitat features. In dry forest habitats, past harvesting has created some open conditions that now have regenerating pines.

Livestock grazing in the uplands and along streams has also affected, and may still affect Neotropical migratory bird habitat. Livestock grazing generally occurs after the majority of songbird breeding has occurred, but may impact late breeding individuals or species, or individuals that are re-nesting after loosing their initial brood. Cattle may have caused shifts in species composition and abundance through selection of more palatable forage species. Cattle reduce ground cover through trampling or consuming vegetation, decreasing cover habitat for some ground nesting birds. Past grazing along and in stream corridors has also reduced riparian shrub habitat. The conditions of some riparian areas and aspen habitats has been improved by new management practices and restoration activities in more recent years, but some areas are still not fully restored to conditions that are most suitable for associated landbird species. In the last 10 years, stream restoration work including fencing of riparian areas in the analysis area has helped improve riparian and aspen stand conditions.

Alternative 1 would not treat Neotropical migratory bird habitat in the analysis area. The habitats that currently exist within the project area would be maintained in the current condition, and provide for the species diversity, density, and distribution that currently exists in the short and mid term. In the long term, open and semi open pine stands would continue to be lost through multi-strata canopy development in the absence of fire. Alternative 2 would combine with past harvest and fire suppression to further reduce the abundance of these habitats within the analysis area. Considering the existing condition of these habitats within the analysis area, it appears likely that in the long term, without treatment, what suitable habitat that remains for dry forest dependent Neotropical migratory birds will be converted to unsuitable habitat, potentially affecting population and their distribution within the analysis area.

Consistency with Direction and Regulations

The Forest Plan directs continued review of DOG/ROG areas, with adjustments to boundaries as appropriate to ensure suitable levels of old growth habitat are provided for species dependent upon them and to ensure those units meet Forest Plan Standards and Guidelines. Under the Dads Creek Project, the Forest Plan would be non-significantly amended to move DOG 363 to facilitate the reduction of ladder fuels and dense canopies along the boundary with Private lands. ROG 363 was created to meet the requirements of a Replacement Old Growth for each DOG.

Regional Forester's Eastside Forest Plans Amendment #2 (USDA 1995) amended the Forest Plan to manage late and old structure (LOS) stands within the Historic Range of Variability (HRV). Under the Dads Creek Project, harvest and prescribed burning projects were designed to move the project area towards the historic balance of OFSS and OFMS. In addition, Amendment #2 directs land managers to maintain connectivity between LOS habitats to allow the free movement of old growth wildlife species. This project establishes connectivity corridors between LOS within the project area and to LOS in adjacent subwatersheds. Amendment #2 gives the Forest Service flexibility to modify or forgo connectivity direction for projects that address safety and health concerns (USDA 2006).

Big game habitat would be modified. Satisfactory cover, already below Forest Plan standards, would be further reduced. Only the summer range portion would maintain satisfactory cover in excess of standards. Total cover in winter range would still meet or exceed standard. A non-significant Forest Plan amendment would be required to reduce satisfactory cover below standards. In a 2003 letter to the Eastside Forests, the Regional Office provided direction encouraging Forests to use site specific Forest Plan amendments to move the landscape towards HRV (USDA FS June 11, 2003). Harvest treatments would occur primarily in warm dry biophysical environments. These stands are considered outside HRV, i.e., overstocked and likely unsustainable given the high risk of uncharacteristically severe fire and insect epidemics.

Snags do not meet Forest Plan standards as a result of past management. Down logs, on average, do meet standards. In the Proposed Action alternative, design features have been incorporated to protect existing snags and large down logs that contribute to the Forest Plan standards. Snags would not be targeted for removal, although incidental snags may be lost during logging to meet operational/safety needs during logging. Project design criteria, such as retaining clumps of live trees around snags and locating landings and temporary roads where there are few or no snags, would help minimize losses. Retention of untreated patches of trees would continue to provide avenues for snag creation. Prescribed fire would likely increase snags although most would be smaller in diameter. Only incidental losses of additional dead wood habitats would be expected.

For northern goshawks, the Proposed Action alternative is consistent with the Forest Plan and the Regional Forester's Eastside Forest Plans Amendment #2. Nest stands would be protected. Known territories would be monitored annually for nesting activity.

If nest sites are active, management activities would be prohibited within ½ mile of the nest sites from April 1 to September 30 to avoid disturbing goshawks during the breeding season.

For blue grouse, the Proposed Action alternative includes design features to protect winter roost habitat as directed by the Forest Plan.

The Proposed Action alternative has been designed to enhance landbird richness. The Proposed Action is consistent with the 1918 Migratory Bird Treaty Act (MBTA) and the Migratory Bird Executive Order 13186. The Proposed Action was designed under current Forest Service policy for landbirds. The Northern Rocky Mountains Bird Conservation Plan (Altman 2000) and the U.S. Fish and Wildlife Service's Birds of Conservation Concern (USFWS 2002) were reviewed for effects disclosure. The Proposed Action alternative was designed to protect or enhance priority habitats for landbird species, including neotropical migratory species.

The Proposed Action is consistent with the Endangered Species Act (see Appendix G, Wildlife Biological Evaluation). The Proposed Action is expected to have No Effect on threatened and endangered species and No Impact on sensitive species. Based on these effects calls, consultation with the US Fish and Wildlife Service was not considered necessary.

Irreversible and Irretrievable Commitments

The project as described would not result in any irreversible or irretrievable effects to the wildlife resource. The project moves habitat conditions towards HRV.

Soils

Regulatory Framework

The Malheur National Forest Plan meets all legal and regulatory requirements for soil conservation. Forest Service Manual R6 Supplement No. 2500.98-1, section 2520.2 says objectives of soil management are "To meet direction in the National Forest Management Act of 1976 and other legal mandates. To manage National Forest System lands ... without permanent impairment of land productivity and to maintain ... soil ... quality..... Soil quality is maintained when soil compaction, displacement puddling, burning, erosion, loss of organic matter and altered soil moisture regimes are maintained within defined standards and guidelines." So if an action maintains detrimental impacts within the standards and guidelines of the Forest Plan, legal requirements for soil conservation would be met. LRMP Forest-Wide Standards 101 and 125-129 relate to soils.

Analysis Methods

Spatial boundaries for soil effects are proposed unit boundaries. Unless otherwise stated, effects are described for the time period immediately after the proposed actions, when effects are at a maximum.

The project soil specialist trained two technicians to assess soil condition in proposed harvest units, collecting information about impacts of past and ongoing activities, and inspecting if special design elements are needed to protect soil. In many units it was unnecessary to collect quantitative data about existing impacts, because inspection revealed existing impacts are "very low" (less than 2% of the unit). The technicians assessed 44 proposed harvest units. In seven of the 44 units, the technicians noted that existing impacts may be more than 2%, so some uncertainty exists about the amount of impacts in these seven units. Sixteen commercial harvest units were not assessed, and none of the pre-commercial harvest units were assessed. These assessments reveal all impacts from past and ongoing activities, including timber harvest, landings, roads, fuel treatments, livestock grazing, and Off Road Vehicles.

Detrimental impacts expected under Alternative 2 are calculated as described in another report (McNeil 2008). Briefly, effects are calculated based on existing condition, volume to be removed, the amount of draws, the amount of slopes steeper than 35%, the presence of a volcanic ash cap and coarse fragments, the amount of uphill skidding, and the presence of short skidtrails. It was assumed that parts of certain units steeper than 45% would not have heavy equipment traffic; this is a design element (Chapter 2). For units that lack conclusive information about existing impacts, it was assumed that existing impacts are average.

Existing Condition

Soil Types

Soils formed in several types of parent material. In the northern part of the project area (approximately north of a line from unit 2 to unit 100), parent material is mostly gabbro, which weathers to loam to clay loam texture. South of this line, south to unit 168, parent material is Clarno volcanic breccia, which weathers to clay loam to clay texture. Parent material in unit 106 and part of 108 is serpentine and peridotite. These rocks tend weather to infertile, low productivity clay.

A cap of volcanic ash 6 to 20 inches thick covers much of the project area. This ash cap tends to be thicker and much more continuous in the southern part of the project area than the northern part, where many places lack the ash cap. Volcanic ash is more easily displaced than other soil.

The most highly erodible soils in the project area have ground cover less than 75% (due to low productivity) and are steeper than 30%. Small inclusions of these highly erodible soils occur in several units, including 22, 24, 36, 40, 44, 46, 48, 64, 68, 74, and 106. Generally volcanic ash caps have a high permeability, and the caps also encourage the development of continuous forest floor, because they are productive. These factors decrease surface erosion hazard on volcanic ash caps, so the erosion hazard is low on slopes less than 30% and moderate on slopes more than 30%.

Soil Detrimental Impacts

The results of the soil assessments on commercial thinning units are presented in Table S-1. Detrimental impacts on the units range from 1% to 12% and average 7%. Much of the impact is from roads. Roads impact an average of 4%, whereas off of roads, impacts average 3%. Many units have recovered from previous logging, because decades have passed since previous logging in these units.

Organic Matter & Nutrients

Decades of fire suppression have resulted in heavier forest floors on most soils than would occur under the natural frequent fire regime. Soil nutrients have become more concentrated in litter and duff. If moderate or high severity fires do occur, there is a potential for more loss of nutrients than under a frequent, low severity fire regime.

Nitrogen has accumulated since fire suppression became effective, so that nitrogen levels are higher than in the 1800s. Fire usually decreases the amount of nitrogen on the land (though easily available nitrogen often increases for one to a few years). Significant fires have not burned in the area for many decades, so the loss of nitrogen during fires has not occurred. Nitrogen has accumulated as nitrogen from the atmosphere is stored in the organic matter of biomass, forest floor, and soil, especially due to the fixation of nitrogen by Ceanothus.

Environmental Consequences

Table S-1. Detrimental soil impacts (% of unit), on proposed tractor logging units.

Unit	Recent Logging (30 yr)	Soil Assess**	Existing Impacts*** % of unit	Roads % of unit	Alt 1 % of unit	Alt 2 % of unit	Sub-soiling Winter Log
2	No	Yes, vl	2	3	5	12	No
10	No	No	3	0	3	11	No
12	No	No	3	0	3	13	No
14	No	No	3	4	7	15	Yes
22	No	Yes, vl	2	4	6	13	No
24	No	Yes, vl	2	4	6	17	No
28	No	Yes, data	7	2	10	16	No
30	No	Yes, vl	2	3	5	15	No
32	No	Yes, vl	2	6	8	17	No
33	No	Yes, vl	2	5	7	13	No
34	No	Yes, vl	2	8	10	16	No
36	No	Yes, vl	2	2	4	14	No
38	No	No	4	6	10	17	Yes
40	No	Yes, vl	2	4	6	17	No
44,46	No	Yes, data	2	10	12	19	No
48	No	Yes, data	2	3	5	13	No
50	No	No	3	5	7	14	No
52	No	No	3	3	6	13	No
54	No	Yes, vl	2	7	9	14	No
56	No	Yes, vl	2	9	11	19	No
58	No	No	3	7	10	18	Yes
60	No	No	4	4	9	15	No
64	No	No	4	5	9	16	No
66	No	Yes, vl	2	3	5	12	No
67	No	Yes, vl	2	5	7	13	No
74	No	Yes, vl	2	5	7	14	No
76	No	Yes, vl	2	6	8	16	No
78	No	Yes, data	7	4	11	16	No
80	No	No	3	5	8	15	No
82	No	Yes, vl	2	6	8	16	No
84	No	No	3	7	10	18	Yes
86	No	No	3	3	6	14	Yes
88,90,92	No	No	3	5	8	14	No
94	No	No	3	4	7	16	Yes
96	No	No	3	4	7	15	No
98	No	No	3	2	5	11	No
100	Yes	Yes, data	10	2	12	18	No
102	Yes	Yes, data	5	0	5	12	No
104	Yes	Yes, data	1	0	1	8	No
106	No	No	4	4	8	14	No
108	No	No	4	6	10	16	No

Unit	Recent Logging (30 yr)	Soil Assess**	Existing Impacts*** % of unit	Roads % of unit	Alt 1 % of unit	Alt 2 % of unit	Sub-soiling Winter Log
110	No	Yes, vl	2	3	5	11	No
112	No	No	3	7	10	14	Yes
114	No	No	3	1	4	14	No
116	No	No	3	3	6	14	No
118	No	No	3	7	10	15	No
120	No	Yes, vl	2	3	5	12	No
154	No	Yes, data	6	2	8	15	No
168	Yes	Yes, data	4	2	7	14	No
186	No	Yes, data	6	0	6	14	No
192	No	Yes, data	5	4	9	17	No
220	No	Yes, data	3	3	6	14	No
222	No	Yes, data	2	2	4	10	No
230	No	Yes, data	4	2	6	17	No
252	No	Yes, data	2	0	2	13	No
254	No	Yes, data	2	0	2	15	No
264	No	Yes, data	4	3	7	16	No
298	Yes	Yes, data	5	2	7	14	No

Table S-2 Biomass Utilization Units

Unit	Recent Logging*	Soil Assess**	Existing Impacts*** % of unit	Roads % of unit	Alt 1 % of unit	Alt 2 % of unit	Sub-soiling Winter Log
4	No	No	3	5	8	13	No
6	No	No	3	2	5	10	No
15	No	No	3	5	8	14	No
42	No	No	3	3	5	11	No
43	No	No	3	5	8	13	No
68	Yes	No	5	5	10	13	Yes
72	Yes	No	5	5	9	13	Yes
152	Yes	No	5	5	10	13	Yes
156	Yes	No	5	3	7	11	Yes
166	Yes	No	5	4	8	13	Yes
170	Yes	No	5	3	7	11	Yes
172	Yes	No	5	4	9	12	Yes
196	No	No	3	2	5	11	No
258	Yes	No	5	0	5	11	No
280	Yes	No	5	3	8	11	Yes

** "Yes, data" means detrimental impact data were collected. "Yes, vl" means detrimental impacts were observed to be a very low percentage.

*** For units where impacts were observed to be very low, impacts were counted as 2%. For units without soil assessments, impacts were counted as the average of similar units, depending on recent logging, and in certain cases, cursory observations.

Alternative 1 – No Action

Direct and Indirect Effects

Under this alternative, no additional soil will be compacted, puddled, or displaced. No additional soil will be eroded by ground disturbing activities. No organic matter or nutrients would be removed.

Cumulative Effects

Cumulative Effects Under Both Alternatives

Existing impacts include the impacts from all past and ongoing actions. Existing impacts are shown under Alternative 1 in Table 1. Past actions include logging, roads, railroads, fuel treatments, fire suppression, grazing, firewood cutting, and Off Road Vehicles. None of the terracing after past wildfires occurred in proposed units. Also, no mining occurred in proposed units.

Root action, animals that burrow in the soil, and freezing water will gradually loosen compacted soil over the course of decades.

Ongoing and foreseeable future actions, such as grazing, firewood cutting, and ORV use, would continue to compact a negligible amount of soil, at about the same rate as in the past. This compaction would be counter-balanced by recovery from similar impacts in the past, so the level of detrimental impacts from these ongoing and foreseeable actions would remain at about current levels.

If a wildfire occurs, the hazard of erosion would greatly increase on severely burned areas due to inadequate ground cover and possibly hydrophobic soil. In addition nutrients and organic matter would be lost.

Cumulative Effects of Alternative 1

As shown in Table 1, existing detrimental impacts range from 1% to 12% and average 7% of each unit. Natural recovery would slowly decrease impacts over decades.

The expected fuel loadings are higher under Alternative 1 than under Alternative 2, as shown in Table F-8 the Fuels section of this EA. As described in the Fuels section, reduction in fuel loads decreases fire behavior and increase fireline control possibilities. Therefore the hazard of severe wildfire and subsequent erosion is higher under Alternative 1.

Alternative 2 – Proposed Action

Direct and Indirect Effects

Tractor Logging

Skidding on steep slopes or unsuitable land often causes displacement. Water bar construction also often causes displacement. Skidding also bares soil, decreases infiltration, and channels overland flow, and thus can accelerate erosion. This acceleration occurs especially on steep slopes. Sites that have steeper slopes are expected to be more impacted than sites with flatter slopes. Uphill skidding is expected to have more impacts than downhill, due to the additional power and slipping of wheels with uphill skidding. The experience of the project soil specialist indicates damage on widely spaced skid trails on slopes less than 45% is acceptable because only moderate amounts of displacement occur, and because of the small size of the area affected.

Displacement and erosion from steep slope skidding would be limited, because slopes steeper than 35% occupy a relatively small proportion of most tractor units and because the extensive ground cover in forests absorbs sediment. Design measures, such as directional felling and winching, would also help to limit displacement and erosion. Usually erosion of skid trails decreases through one to three years, until it stops. Decreased productivity due to severe displacement and erosion can last hundreds of years. Design elements would keep displacement and erosion to a minimum, within acceptable levels. Design elements that effectively control displacement and erosion include a prohibition on skidding on highly erodible soil (generally, soil steeper than 30%, with less than 75% ground cover), a prohibition on skidding on steep slopes (>45% downhill, >25% uphill on ash soil, >35% uphill on non-ash), limitations on skidding in draws, and water bar requirements.

Skidding would cause negligible sediment export from the units, despite sediment movement within units as described in the preceding paragraphs. Sediment normally is deposited less than 15 feet down slope from skid trails as the water is slowed by ground cover and percolates into the soil. This is true even on slopes up to 45%. The ground cover is provided by litter, duff, and herbaceous plants; leaving felled trees is not necessary, and would increase the hazard of a severe wildfire occurring.

Much of the skidtrail area would be compacted, and some of the soil tracked only once or twice would be compacted. Compaction usually lasts more than 20 years; some compaction lasts more than 50 years. Table 1 presents expected detrimental impacts on the tractor units. If the unit happens to be harvested over deep snow or on deeply frozen soil, increase in compaction would be about one half of the predicted amount. Design measures that are effective at limiting compaction include designating skidtrail locations, requiring skidtrails to be widely spaced, reusing existing skidtrails where appropriate, prohibiting skidding under wet conditions, allowing only low ground pressure machinery off of skidtrails. It is unnecessary to require low ground pressure yarding machinery. The design measures would keep compaction to a practical minimum and indicate the Forest Plan standards likely would be met in all units.

Landings are severely impacted. Design elements that encourage re-use of appropriately located landings, and subsoiling of landings, would keep these impacts to a minimum.

Biomass Utilization

Biomass can be removed by two methods. One is like current logging methods, with skidders. The other is with low ground pressure forwarders and other equipment on relatively closely spaced forwarder trails. These methods could be applied in several combinations:

- For units where there is no large tree harvest but there is biomass harvest by feller-buncher and skidder, effects perhaps would be similar to a light harvest (1.5 mbf/ac) of larger trees. This assumption was used in calculating effects for Table 1. Detrimental impacts would probably increase by 5% to 7%.

- For units where there is no large tree harvest but there is biomass harvest by low ground pressure machinery, detrimental impacts would increase by about 5%, similar to forwarder operations on the Umatilla and Wallowa-Whitman National Forests.

- For units where there is large tree harvest, the biomass could be harvested at the same time with the same machinery as the larger trees. In this case, the biomass utilization would probably have no significant impact above the larger tree harvest. A sale administrator has observed that neither feller bunchers nor skidders impacted more area than if only commercial material was harvested.

- The biomass could be harvested later with skidders and feller-bunchers. In this case, the biomass harvest would increase impacts above larger tree harvest by about 2%, because the feller-bunchers would impact additional area, although the skidders would re-use the same skidtrails.

- The biomass could be harvested later with low ground pressure machinery. In this case, the biomass harvest would increase impacts above larger tree harvest by about 4%.

Subsoiling or Winter Logging

Landings would be subsoiled where suitable. Subsoiling landings would decrease their detrimental impacts from about 3% un-subsoiled to about 1% of the unit after subsoiling.

In addition, subsoiling or winter logging may be used on several stands (see Chapter 2). If so, increases in detrimental impacts would be only about 50% of what they would be without subsoiling. However, it is expected that further monitoring will indicate that subsoiling or winter logging will be unnecessary on most or all of these stands, like they are unnecessary on all stands that have soil assessments.

Subsoiling bares soil, forms channels, makes soil particles more easily detachable, and disrupts roots, thus raising the risk of erosion for a few years. However, subsoiling also increases infiltration which decreases the risk of erosion. This increased infiltration, and the subsoiling design elements means that sediment production from erosion due to subsoiling would be negligible.

Grapple Piling and Pile Burning

A design element in Chapter 2 requires grapple piling machinery to have a low ground pressure, to operate on dry soil, and to operate on skid trails where possible. Low ground pressure is required for grapple piling machinery but not skidding machinery because grapple machinery are not restricted to skidtrails. With this design element, the project soils specialist expects grapple piling would compact about 1% of each unit where it is used. Feller-bunchers of similar ground pressure operating off skidtrails compacted about 1.5% of a unit (McNeil 1996). This would be in addition to impacts caused by harvest.

Soil beneath grapple piles would be detrimentally burned ("sterilized"), taking many years to recover. However, the project soil specialist has rarely, if ever, observed detrimentally burned soil that occupied more than 1% of a unit and similar results are expected for this project. A design element limits detrimentally burned soil to a maximum of 3% of the acreage.

Temporary Road Construction

Temporary road construction will cause small, localized, temporary increases in erosion hazard, as existing ground cover is disturbed (especially the soil excavated on any side slopes traversed), as soil is compacted, and as ruts form. This erosion would disappear within two years of rehabilitation of the roads.

On temporary roads, much of the productivity lost to compaction would be restored during rehabilitation. Perhaps 1/2 of the area of the roads would be in detrimental condition immediately after rehabilitation. For instance in unit 12, temporary road construction would detrimentally impact about 2% of the unit, and after rehabilitation, about 1% of the unit would remain in detrimental condition, although hydrological function would be restored. Productivity lost to remaining displacement and compaction would recover over the course of several decades.

Tractor Winch and Skyline

Tractor winch and skyline logging causes much less displacement, erosion, and compaction than tractor logging - detrimentally affecting about 1 - 2% of the area of a unit. Logs that drag can displace soil and concentrate erosive runoff in furrows. Required cross drains would divert runoff from the furrows, so the amount of erosion would be negligible, and sediment would be unlikely to leave the unit.

Summary of Detrimental Impacts

As shown by the difference between Alternative 1 and Alternative 2 in Table 1, increases in detrimental impacts range from 6 to 13%, and average 8% for tractor units with large trees.

Prescribed Burning

Soil effects from prescribed burning would be minor. Ground cover would decrease, especially during fall burns. However, burning would be controlled so as to avoid decreasing ground cover below LRMP standards (Forest-Wide Standard 127); erosion would not be significant. The ground cover loss would recover through the course of between one and five years.

Soil effects from fireline construction would be minor. No dozer lines would be constructed. Erosion would be further controlled by a design element in Chapter 2 that requires waterbars on slopes steeper than 25%, and bans fire lines that go down draw bottoms. Fire lines impact a negligible area of soil.

Organic Matter and Nutrients

Logging would remove nutrients and organic matter in logs, and fuel reduction treatments would remove nutrients and organic matter during burning and biomass utilization. The removal, especially removal of nitrogen, may decrease site productivity a few percent on some sites. However, on many or most sites, productivity likely is not limited by nutrients or organic matter. Also, removal of nutrients would be limited because nutrients would remain in the soil and the remaining forest floor, and because many trees would be left. Removing organic matter and nutrients by logging and fuel control would move many sites back toward their fertility status before Euro-Americans arrived, because nutrient and organic matter loss in fires was common then. Little dead wood existed before fire suppression became effective, because low severity fires burned it up. These high fire frequency ecosystems persisted for thousands of years with low levels of forest floor and dead wood, so these ecosystems are adapted to low levels of organic matter, so removal of the unnatural organic matter would have only a small adverse effect.

Cumulative Effects – Alternative 2

See Alternative 1, Cumulative Effects, Changes Under Both Alternatives section for a description of changes that would occur under both alternatives.

Detrimental impacts from the proposed operations (harvest, subsoiling, fuels control) add to past actions. Tables S-1 and S-2 show what the expected site-specific condition would be. For Alternative 2, detrimental impacts would range from 8% to 20%, and average 15%. Thus the Forest Plan standard of 20% (Forest-Wide Standard 126) or less likely would be met in all units.

If a wildfire occurs, hazard of erosion would greatly increase on severely burned areas due to low ground cover and possibly hydrophobic soil. However, the expected fuel loadings are higher under Alternative 1 than under Alternative 2, as shown in Table F-8 the Fuels section of this EA. As described in the Fuels section, reduction in fuel loads decreases fire behavior and increase fireline control possibilities. Therefore the hazard of severe wildfire and subsequent erosion is lower under Alternative 2.

Consistency with Direction and Regulations

All alternatives would be consistent with Forest Plan soil protection standards, because all the Forest-wide Standards mentioned above under the "Regulatory Framework" section would be met, as explained in all the preceding sections.

Irreversible and Irretrievable Commitments of Resources

Irreversible Commitments

There are no anticipated long-term irreversible commitments of the soil productivity. There may be short-term losses of growth related to soil compaction, but compaction is to be kept below 20% of the forest area, and the growth reduction on compacted ground is about 15%. This would result in a total maximum growth loss of approximately 3% per year of the growth potential until the compaction gradually diminished (in about 50 years).

Irretrievable Commitments

There are irretrievable commitments of the soil resources because of the new landings and temporary roads that are built for the logging/biomass operations. They are to be rehabilitated after use, but there will be a lag in revegetation since the sites are impacted more heavily than the surrounding forestland.

Hydrology

Regulatory Framework

The main objective of the Federal Water Pollution Control Act of 1972 (Public Law 92-500 also known as the Clean Water Act) is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters" (CWA Section 101 (a)). The Forest Service is directed to "Comply with State requirements in accordance with the Clean Water Act for protection of waters in the State of Oregon (Oregon Administrative Rules, Chapter 34041) through planning application and monitoring of Best Management Practices (BMPs) in conformance with Clean Water Act, regulations, and federal guidance issued thereto." (Land and Reourse Management Plan, Malheur National Forest (Forest Plan), Standard 117, Chapter IV, page 39)

The Forest Plan provides direction to protect and manage water resources through compliance with State requirements (described in a May 2002 Memorandum of Understanding (MOU)) that are in accordance of the Clean Water Act and the selective use and enforcement of Best Management Practices (Forest Plan, Standards 117-120, Chapter IV, page 39). The MOU requires that Forest Service, through management activities, cannot further degrade water quality impared streams. The MOU recognizes that BMPs are the primary means to control non-point source pollution on National Forest lands. Adherence to BMPs will provide adequate protection and avoid significant effects to listed impaired streams within the project area or its influence.

The Forest Plan also provides direction to protect or enhance riparian-dependent resources in watersheds supporting anadromous fish, and to protect habitat and populations of anadromous fish (MA 3B, Chapter IV, pages 62-68; Amendment 29; The Interim Strategies for Managing Anadromous Fish-Producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California (PACFISH)). PACFISH identifies Riparian Habitat Conservation Areas (RHCAs), Riparian Management Objectives, and standards and guidelines for activities in RHCAs. Standards contained in Malheur Forest Plan Amendment 29 considered to be more protective than those in PACFISH, supercede comparable ones in PACFISH.

Analysis Methods

Streams and ephemeral draws in the project area were mapped using a combination of USGS topographic maps, information in the Malheur National Forest GIS, past watershed field surveys and recent reconnaissance of streams and draws.

Temperature data was collected by a continuous recording device and three seasonal "grab" samples. Unfortunately, the recording device malfunctioned and had to be sent to the company for data retrieval; no information was available in time for this analysis. Sediment data were not collected.

Effects of harvest and road building on water quality were concluded from a review of research, and experience of the project hydrologist.

Cumulative effects on water quality were assessed by considering the proportion of the area treated, the proposed treatment, and past events.

Affected Environment

The project area is approximately 7192 acres; 7080 acres is in the Dads Creek subwatershed, 111 acres is in the Dixie Meadows subwatershed, and less than 1 acre is in the Isham Creek subwatershed. These 3 subwatersheds are tributary to the Upper John Day River. Four miles of the Upper John Day River are outside of the proposed project area, but are included in the project analysis area for cumulative effects.

Upper John Day River

The Upper John Day River is listed in the Oregon 2004-2006 Integrated Report Database (303(d) list) for summer temperature for anadromous fish passage and salmonid rearing. The river is about 5 miles downstream from the project area.

Dads Creek Subwatershed

The 27,265 acre Dads Creek subwatershed drains into Upper John Day watershed. Approximately 20,075 acres (74% of the watershed) of the lower drainage are private or non National Forest lands. Approximately 26% of the subwatershed is under National Forest management and is generally above 4800 feet. There are several streams in the project area in the Dads Creek subwatershed including:

Dads Creek: Dads Creek flows in a southern direction into the John Day River; the upper 3+ miles are on National Forest land, the lower 5 miles flows through private land.

It is listed in the Oregon 2004-2006 Integrated Report Database (303(d) list) for 2 parameters. The first parameter is sedimentation and it is noted that there are insufficient data to determine if the standard is met. The second parameter is summer temperature for anadromous fish passage and salmonid rearing. The data for this determination were collected at the mouth of Dads Creek. Temperature data was collected at the Forest boundary on June 26, August 17, and November 1, 2007, to calibrate the continuous recording equipment installed there. The readings were 10.7 degrees C, 15.5 degrees C, and 1.7 degrees C respectively which are all below the standard of 17.8 degrees C.

This appears to be the only drainage in the project area in which railroad logging occurred; most grades paralled the slope. Only 2 locations showed evidence of the grade paralleling the stream. The channels are still adjusting as portions of the bank slough off while tring to reach their natural angle of repose.

Jeff Davis Creek: Jeff Davis Creek flows in a south to southwest direction; the upper 1+ miles is on National Forest land, the remaining 5 miles flows through private land. This stream is not on the 303(d) list for any parameters.

Dans Creek: Dans Creek flows southwesterly into the John Day River. The upper 1+ miles is on National Forest land, the remaining 3.5 flows through private land. It is listed in the Oregon 2004-2006 Integrated Report Database (303(d) list) for summer temperature for anadromous fish passage and salmonid rearing. The data supporting this listing were collected at the Forest boundary and at the mouth. No additional data has been collected.

Eureka Gulch: Eureka Gulch flows southwesterly into Dans Creek approximately river mile 2. This stream is not on the 303(d) list for any parameters.

Dixie Meadows Subwatershed

The Dixie Meadows subwatershed is 20,116 acres and drains into the Upper John Day watershed. Approximately 60% of the lower drainage is private or non National Forest lands. There is one ephemeral channel (and no RHCAs) in the project area that drains into Dixie Creek about 3 miles downstream.

Isham Creek Subwatershed

The 21,610 acre Isham Creek subwatershed also drains into Upper John Day watershed. Less than 25% of the subwatershed is under National Forest management, the majority of the subdrainage is private land. There are no streams in the project area in the Isham Creek subwatershed. A tributary to Isham Creek is about 0.2 miles from the project boundary and Isham Creek is over ¾ miles to the south of the project boundary.

Environmental Consequences

Alternative 1 - No Action

This alternative proposes no fuel reduction through harvest, pre-commercial thinning or prescribed fire. There would be no temporary road construction or maintenance other than scheduled maintenance. No roads would be opened or closed.

Direct / Indirect

Riparian vegetation will continue to grow and provide shade unless altered by a disturbance event such as wildfire. The potential for crown fire would remain moderate to high; fire severity would also remain high. Should a wildfire occur with these conditions, mortality of the riparian vegetation could be high; temperature and sedimentation could increase.

Cumulative

Past activities listed in Appendix C such as logging, roads, railroads, fuel treatments, fire suppression, grazing, firewood cutting, and Off Road Vehicles were considered. Because there are no direct or indirect impacts from the no action alternative, there are no cumulative impacts.

Alternative 2 – Proposed Action

Dads Creek Subwatershed

There are no proposed harvest or pre-commercial thinning units in RHCAs in the Dads Creek subwatershed. Trees within RHCAs that are considered danger trees would be felled; those portions that fall within the RHCA would be left, those portions outside of the RHCA could be removed as product. During prescribed fire activities, lighting would occur in RHCAs with an objective to reduce the surface fuels. By lighting within the RHCAs lighting patterns can be utilized that will best meet the surface fuel reduction with limited tree mortality and soil exposure.

Less than 2 miles of temporary road will be constructed and rehabilitated after the project is finished. Approximately 5.5 miles of closed, re-vegetated road will be opened during the life of the project and then closed with berm(s), slash, and appropriate drainage. Two ephemeral road crossings would be reconstructed. Approximately 24 miles of closed road (not grown in) will be opened and reclosed after the project is completed. One and 7 tenths miles of currently open road will be closed after the completion of the project.

Dixie Meadows Subwatershed

Precommercial and commercial harvest and prescribed fire treatments will occur on approximately 110 acres. The ephemeral channel will have a 10-50 foot buffer; excluding harvest activities. There are no proposed prescribed fire activities in this part of the project area.

Isham Creek Subwatershed

Less than 1 acre (< 0.001% of the subwatershed) of precommercial thinning in the uplands is proposed in the Isham Creek subwatershed. There is no activity proposed in any RHCA in the Isham subwatershed.

Direct / Indirect

Dads Creek Subwatershed

Except for danger trees, no trees would be cut in the Cutting danger trees on haul routes in RHCAs will constitute a minimal amount of the total riparian area and would not affect stream shading. There would be no reduction in stream shading or increase in stream temperature from thinning or harvest activities. There could be incidental tree mortality from prescribed fire activities in the RHCAs; coupled with the loss of trees from danger tree felling, the total amount of riparian area affected would still be minimal. Prescribed fire BMPs will be in place to reduce the impacts so that most of the vegetation and ground cover will be retained in RHCAs and no increase in sedimentation should result from this activity.

There could be short term, localized, temporary increases sedimentation from road activity at stream crossings. BMPS will be in place to minimize effects from temporary road construction and road maintenance.

The wildfire hazard, and associated adverse impacts to riparian areas, would be greatly reduced upon completion of project activities.

Dixie Meadows Subwatershed

There would be no vegetation removed from the ephemeral buffer during thinning or harvest activities. Any proposal to cross the draw with heavy equipment would have to be approved by an aquatic specialist and BMPs would have to be in place to reduce effects to channel disturbance. Stream temperatures in the subwatershed would not be affected. Compliance with prescribed fire BMPs will ensure minimal soil exposure from prescribed fire activity. No increase in sedimentation or stream temperature should result from activities associated with the proposed action.

The wildfire hazard, and associated adverse impacts to riparian areas, would be greatly reduced upon completion of project activities.

Isham Creek Subwatershed

There would be no vegetation removed from the ephemeral buffer during thinning or harvest activities. Any proposal to cross the draw with heavy equipment would have to be approved by an aquatic specialist and BMPs would have to be in place to reduce effects to channel disturbance. There are no predicted increases in temperature or sedimentation in any streams in the Isham Creek subwatershed.

The wildfire hazard, and associated adverse impacts to riparian areas, would be greatly reduced upon completion of project activities.

Cumulative

Legacy effects from past activities (listed in Appendix C such as logging, roads, railroads, fuel treatments, fire suppression, grazing, firewood cutting, and Off Road Vehicles) including increased stream temperatures and sediment will continue to occur.

BMPs and standard buffer widths defined by PACFISH have been shown to adequately maintain stream temperatures and reduce the impacts of sediment production by maintaining adequate ground cover, stream canopy, and bank stability through root strength. Localized loss of ground cover or root strength would be short term (1 to 2 years) and long term cumulative effects would not occur.

Because there would be no adverse changes to stream temperature or sedimentation (direct or indirect effects) from the proposed action, there would be no cumulative impacts The proposed action would not inhibit the recovery of these stream systems over time.

Irreversible and Irretrievable Commitments

There are no irreversible and irretrievable commitments to water quality resulting from the proposed action.

Consistency with Direction and Regulation

This project is consistent with Forest Plan direction and with service-wide regulation for water resource protection.

The Forest Service's responsibilities under the Clean Water Act are described in a May 2002 Memorandum of Understanding (MOU) between the Oregon Department of Environmental Quality and the Forest Service. The Forest Service is directed to comply with State requirements in accordance with the Clean Water Act for protection of waters of the State Of Oregon (OAR chapter 34041) through planning, application, and monitoring of Best Management Practices (BMPs), which are recognized as the primary means to control non-point source pollution on National Forest lands. BMPs specific to the project are listed below and apply to the proposed action. The Blue Mountain Ranger District hydrologists and fish biologist, and sale administrators and harvest inspectors assigned to the project monitor BMPs. The MOU also directs that the Forest Service cannot further degrade water quality impaired streams. As shown in the Effects section, the proposed action would not raise temperature in Dads or Dans creeks that are the only two 303(d) listed water bodies in the project area.

Fisheries

Introduction

This section summarizes the species and status of fish present in the Dads Creek Wildland Urban Interface (WUI) Project area as well as existing conditions for aquatic species and their habitat. This report builds on conclusions from soils and watershed sections and determines direct, indirect and cumulative effects on aquatic species and their habitat.

Regulatory Framework

The Executive Order 12962 of 1995 (aquatic systems and recreational fisheries) requires federal agencies to conserve, restore, and enhance aquatic systems to provide for increased recreational fishing opportunities nationwide. The Order requires federal agencies to evaluate the effects of federally funded actions on aquatic systems and document those effects relative to the purpose of this order.

The two principle laws relevant to fisheries management are the National Forest Management Act of 1976 (NFMA) and the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.). Direction relative to fisheries is as follows:

NFMA requires the Forest Service to manage fish and wildlife habitat to maintain viable populations of all native and desirable non-native wildlife species and conserve all listed threatened or endangered species populations (36CFR219.19).

ESA requires the Forest Service to manage for the recovery of threatened and endangered species and the ecosystems upon which they depend. Forests are required to consult with the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service (NMFS) if a proposed activity may affect the population or habitat of a listed species.

The Malheur National Forest Land and Resource Management Plan (Forest Plan) as amended (USDA 1990), provides direction to protect and manage resources. The Specialist report sites a detailed list of the portions of the Forest Plan relevant to fisheries and fisheries habitat requirements. In addition Forest standards and guidelines along with relevant laws are cited. Of special interest are Forest Plan amendment 29 and PACFISH (1995). Recommendations regarding fisheries habitat within the Dads Creek WUI project area would adhere to this regulatory framework.

The fish-bearing portions of Dads Creek, Dans Creek, and Eureka Gulch are protected by 600-foot wide (total width) RHCA's (as defined within PACFISH). RHCA widths along other streams in the project area vary depending on whether streamflow is perennial or intermittent.

The John Day River within the Dads Creek subwatershed in the Dads Creek WUI Project area meets the three criteria for PACFISH Key Watersheds. The intent of designating Key Watersheds is to provide a pattern of protection across the landscape where habitat for anadromous fish would receive special attention and treatment. Priority within these watersheds would be to protect, or restore habitat for listed stocks, stocks of special interest or concern, or salmonid assemblages of critical value for productivity or biodiversity. Criteria considered to designate Key Watersheds are:

- Watersheds with stocks listed pursuant to the ESA, or stocks identified in the 1991 American Fisheries Society report as “at risk” or subsequent scientific stock status reviews; or
- Watersheds that contain excellent habitat for mixed salmonid assemblages; or.
- Degraded watersheds with a high restoration potential.

Analysis Methods

The analysis area encompasses all fish habitats that have the potential for effects from the Dads Creek WUI project. Based on topography, drainage patterns and the effects analysis, the project analysis area (action area) includes the following streams: Approximately 4 river miles of the John Day River from the confluence of Strawberry Creek upstream to the confluence of Dans Creek, Dans Creek, Eureka Gulch, Jeff Davis Creek, and Dads Creek.

The project area lies within the Dads Creek Watershed of the Upper John Day River (main stem) subbasin. Information was compiled from the field trips to much of the perennial portions of Dads and Dans Creeks, and portions of Eureka Gulch. The Malheur National Forest Geographic Information System was also used along with discussions with ODFW personnel from the John Day Watershed District. A 1969 stream habitat survey from ODFW was the only habitat data available within the Dads Creek subwatershed. The Existing Condition was evaluated qualitatively, based on the principles of applied fisheries and watershed science, professional judgment and knowledge of the area.

Unknown and Unavailable Information: Stream conditions on private land within and downstream of the analysis area are generally unavailable; however, because much of the land is visible from existing roads, the land use practices are readily observable.

Existing Condition

Aquatic Species

The John Day River within the Dads Creek watershed is home to populations of Mid-Columbia summer-run steelhead (*Oncorhynchus mykiss*), Inland Columbia Basin redband trout (*O. mykiss gairdneri*), westslope cutthroat trout (*O. clarki lewisi*), and Mid-Columbia spring-run Chinook salmon (*O. tshawytscha*) and is listed by Buchanan (1997) as historic habitat for bull trout (*Salvelinus confluentus*). Though no documented sightings, the western ridged mussel (*Gonidea angulata*) and California floater (*Anodonta californiensis*) may also present within the mainstem of the John Day River. Perennial tributaries to the John Day River within the Dads Creek watershed contain local populations of redband and may be occupied by westslope cutthroat and bull trout during wetter periods of the present climate. Columbia spotted (*Rana luteiventris*) frogs may also be present within the watershed.

Management Indicator Species, Threatened, Endangered and Sensitive Species

Management Indicator Species (MIS) are species of vertebrates and invertebrates whose population changes are believed to best indicate the effects of land management activities. Forest Plan Standard 61 (p. IV-32) lists species and gives direction to provide for habitat requirements of MIS species. Aquatic MIS in the project area for the Dads Creek WUI project include bull trout, cutthroat trout, rainbow/redband trout and steelhead trout.

Threatened and endangered species are listed under the ESA; whereas, sensitive species are identified by the Forest Service Regional Forester. An endangered species is an animal or plant species that is in danger of extinction throughout all or a significant portion of its range. A threatened species is an animal or plant species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. A sensitive species is an animal or plant species for which species viability is a concern either a) because of current or predicted downward trend in population numbers or density, or b) because of current or predicted downward trends in habitat capability that would reduce a species' existing distribution. Forest Plan Standard 62 (p. IV-32) gives direction to meet all legal and biological requirements for the conservation of threatened and endangered plants and animals. Standard 62 states, "Assess all proposed projects that involve habitat changes or disturbance and have the potential to alter the habitat of threatened, endangered or sensitive plant and animal species." When threatened or endangered species or habitats are present, follow the required biological assessment process, according to the requirements of the ESA (Public Law 93-205). Forest Plan Standard 64 further states, "Meet all consultation requirements with the US Fish and Wildlife Service and state agencies". Effects to aquatic threatened, endangered, and sensitive species are analyzed in the Dads Creek WUI Project Aquatic Biological Assessment (Appendix X).

Five threatened, endangered and sensitive (TES) salmonid species, one sensitive amphibian species, and two sensitive invertebrate species are found or may be found in the Dads Creek WUI project analysis area:

- Summer-run steelhead of the Middle Columbia River Distinct Population Segment (DPS) is listed as threatened under the ESA and their critical habitat was designated on September 2, 2005. They are also on the State of Oregon sensitive species list.

- Columbia River bull trout is listed as threatened under the ESA and their critical habitat was designated on October 26, 2005. They are also on the State of Oregon sensitive species list.

- Spring-run Chinook salmon of the Middle Columbia River Evolutionarily Significant Unit (ESU) are listed on the Region 6 sensitive species list; they are also covered under Essential Fish Habitat (EFH) for consultation with the NMFS under the Magnuson-Stevens Fishery Conservation and Management Act (MSA).

- Redband trout are considered the native, resident form of rainbow trout and they are on the State of Oregon and Region 6 sensitive species lists.

- Westslope cutthroat trout are on the State of Oregon and Region 6 sensitive species lists.

- Columbia spotted frog is on the Region 6 Sensitive Species list.

- Western ridged mussel is on the Region 6 Sensitive Species list.

Summer-run Steelhead Trout

The Mid-Columbia River (MCR) steelhead trout is named for the timing of their adult spawning run. The name "summer" refers to the time of year the fish enter the Columbia River for migration to the middle portion of the Columbia River, between Mosier Creek in Oregon and the Yakima River in Washington. First time spawning fish are generally 4-5 years old. Individuals are capable of spawning more than once before they die, though spawning more than twice is rare. Adult MCR steelhead trout spend up to one year in fresh water prior to spawning. These fish can utilize headwater areas for spawning purposes and require clean gravels with nearby resting pool habitat during the three to six week spring spawning period. Juveniles spend 1-4 (generally 2) years in fresh water before migrating to the ocean as smolts. While in the fresh water rearing stage, young steelhead prefer a water temperature range between 10-13° C, adequate pool habitat, and cover in the rearing streams.

Most steelhead trout spawning and rearing occurs in the second to fourth order streams in a forested environment. Even when small streams are not accessible to migrating fish, because of barriers or steep gradients, they are vitally important to the quality of downstream habitats. Adults begin to move into Dads Creek as early as January, with the largest influx occurring from April through June (ODFW 2004). The peak spawning period is late April and early May (ODFW 2004). Unlike other salmonids, steelhead do not necessarily die after spawning. However, only 1% of steelhead survive to spawn a second time (Behnke 2002).

Columbia River Bull Trout

The upper John Day River contains one of two existing populations within the mainstem of the John Day River. The other is in Indian Creek, which is approximately 7.2 river miles downstream from Dads Creek and Dads Creek watershed. The Upper John Day River population is considered to have both migratory and resident life histories. Abundance is low and spawning habitat is highly fragmented and restricted to portions of tributaries with cool stream temperatures and adequate flows. Bull trout spawn in the fall after temperatures drop below 48°F, in streams with good flows of cold water, clean gravel to cobble substrate, and low gradient sections of stream. Spawning areas are often associated with cold springs and groundwater influence. Eggs require a long incubation period compared to other salmon and trout, hatching in late winter or early spring. Fry may remain in the stream gravels for up to three weeks before emerging.

Spring-run Chinook Salmon

Chinook salmon exhibits two behavioral forms: ocean-type and stream-type. Ocean-type Chinook salmon juveniles migrate to the ocean within the first year of life; whereas, stream-type juveniles typically spend one or more years in fresh water before migrating to the ocean. In the Dads Creek watershed, Chinook salmon are of the stream-type form. For a more detailed description of lifecycle and habitat usage see the specialist report.

Redband Trout

Inland Columbia Basin redband trout have the most extensive area of all game fishes in the Blue Mountains. They are in the smallest headwater areas as well as in the largest rivers of the Blue Mountains.

Inland Columbia Basin redband trout are assumed to be the resident form of the anadromous steelhead. Most redband trout spawning and rearing occurs in the second to fourth order streams in the forested environment. Even when small streams are not accessible to migrating fish because of barriers or steep gradients, they are vitally important to the quality of downstream habitats. Their distribution within the proposed project area and habitat needs, are similar to the steelhead. However, redband trout spawning may occur in areas with insufficient flow for steelhead spawning.

Westslope Cutthroat Trout

The John Day River basin has been identified as one of six major river basins in which westslope cutthroat trout reside. Three life-history forms are found in this species: resident (lives in small streams), fluvial (migrates between small streams and rivers), and adfluvial (migrates between lakes and streams). The fluvial form of westslope cutthroat trout may be found in the Dads Creek watershed during wetter periods of the present climate. Historically cutthroat may have been of the fluvial form in Dads Creek and its tributaries (Shepard et al. 2003). Spawning typically occurs between April and June when water temperatures range between 43°F and 48°F (6°C to 9°C), and these fish rarely live longer than four years (Behnke 2002).

The westslope cutthroat trout differ from other fish in their relatively small size and feeding habits. This species specialize as invertebrate feeders and, consequently, do not compete directly with more piscivorous (fish-eating) species like bull trout (Behnke 2002). In addition to habitat degradation, hybridization with nonnative rainbow trout and displacement by brook trout in small streams represent the common biological threats to the species (Behnke 2002).

Columbia Spotted Frog

The Columbia spotted frog is on the Regional Forester's Sensitive Species List and is a candidate for Federal listing under the ESA. Spotted frogs are highly aquatic and are rarely found far from permanent water. Breeding habitat is usually in shallow water in ponds or other quiet waters along streams. Breeding may also occur in flooded areas adjacent to streams and ponds. Adults may disperse overland in the spring and summer after breeding. Habitat has been degraded by past management activities, such as livestock grazing, road construction along streams, and timber harvest adjacent to streams, lakes ponds, springs, and marshes.

The spotted frog is considered present in all subbasins on the Malheur National Forest. It is assumed this species is widely distributed in the project area. Habitat probably exists along most low gradient (less than 2%) sections of perennial and some intermittent streams within the project area. No survey records or sightings are recorded from the project analysis area.

Western Ridged Mussel

Habitat occupied by the mussel is generally characterized as substrates of lakes, streams, and rivers that range in size from gravel to firm mud with the presence of at least some fine material (e.g. sand, silt or clay). Preferred sites generally have constant flow, rather shallow water (typically < 3 m in depth), and well-oxygenated substrates, especially when occurring in finer sediments.

There is little information available regarding the biology of the western ridged mussel. It reproduces via internal fertilization, producing parasitic larva on an undetermined fish host(s). Adults of this species are generally sessile and may move only if repeatedly disrupted. From counts of annual growth rings, it is believed that this mussel can live up to about 30 years.

U.S. populations are regarded as declining. This species is threatened by the continued loss or degradation of suitable habitat. In general, North American freshwater mussels are very sensitive to environmental changes and consequently the order contains a high percentage of endangered species in North America. Other threats to this species are eutrophication, heavy metals, and transition elements.

California Floater

The California floater is a freshwater clam with an extremely thin, large shell, about 80 mm (3.20 in.). As bivalves, California floaters are filter-feeders that trap and consume plankton. Adult freshwater mussels are largely sedentary. Movement may result from water disturbance, low water, seasonal temperature change, or during spawning. Movement is confined to either burrowing deeper into sediments though rarely completely beneath the surface or in a distinct path often away from the area of stimulus. Vertical movement is generally seasonal with rapid descent into the sediment in autumn and gradual reappearance at the surface in spring. Horizontal movement is generally less than a few meters and is not considered a dispersal mechanism. Several factors may be responsible for species distribution within a stream including stream size and surface geology, utilization of flow refuges during flood stages, and patterns of host fish distribution during spawning periods.

Nearly all mussels require a host or hosts (usually fish) during the parasitic larval portion of their life cycle. No information is available on the host species for California floaters. Densities and distribution of freshwater mussels appears to be correlated positively with host-fish densities. Fertilization occurs internally with eggs fertilized by sperm brought though the brood pouch (formed by the gills of the female) with respiratory currents of water. Eggs are continually bathed by currents while incubating and hatch into larvae. Upon release, the larvae fall to the substrate. The larvae will then attempt to attach to tail edges or fins of host fish. The time to juvenile metamorphosis is approximately 27 days. Once the mussel detaches from its host, the juvenile stage begins and lasts about two years. During this time organs transform from immature to adult state. Although life span of California floaters is unknown, closely related species live about 10 to 15 years.

California floaters are found in both lakes and lake-like stream environments, preferring shallow areas of unpolluted perennial waters. Adult mussels typically live in mud or sand and juveniles in loose sand.

Habitat

The quality of fish habitat is affected by conditions within the stream channel and riparian areas along the channel. This section presents information on riparian and instream conditions. Important aquatic habitat elements as defined by PACFISH and/or Forest Plan Amendment 29 include: 1) pool frequency, 2) water temperature/stream shading, 3) large woody debris, 4) bank stability, 5) width to depth ratio, and 6) embeddedness. These habitat elements are important in maintaining aquatic habitat function and health and are a focus for this report. Stream surveys have not been completed for the perennial streams within the analysis area. The analysis of stream habitat and riparian areas were based on field visits in September through November of 2007, a 1969 ODFW stream survey report of Dads Creek, and personal communication with ODFW personnel from the John Day District. Little quantitative data was available, but the field visits and discussions with ODFW personnel were sufficient to identify present conditions in regards to aquatic habitat.

Upper John Day River

Approximately four river miles of this river is considered to be within the project analysis area in regards to possible cumulative effects from sediment inputs from the tributaries of Dads Creek, Jeff Davis, Dans Creek, and Eureka Gulch (tributary to Dans Creek) that are within the project area. Approximately 1.7 river miles of the lower section of the John Day River is within the Confederated Tribes of the Warm Springs Reservation (CTWS) Forest Conservation Area and the rest of the river (~2.3 river miles) is within private land. Nearly all land use is considered to be agriculture. Orhtho photos from GIS indicated riparian wood canopy cover appears somewhat fragmented with less than 50% canopy cover. These reaches are on the Oregon Department of Environmental Quality (DEQ) 303d list for summer salmonid rearing temperatures that are two high. Site visits also indicated width to depth ratios were high, which contributes to the high summer stream temperatures. Irrigation ditches have affected flows, though the reaches still support Chinook and steelhead rearing and spawning habitat. Instream large wood appears to be low. The ortho photos, site visits along roads, and personal communication with ODFW personnel indicate that the river appears to be handling sediment transport. Embeddedness did not seem excessive.

Species that may be present within the John Day River include Mid-Columbia Spring Chinook, Mid-Columbia River Steelhead, Columbia River Bull trout, westslope cutthroat trout, and Inland redband trout. Western rigid mussel and California Floater may be present in slower flow sections of the mainstem. Columbia spotted frog may occur within localized areas of backwater and slow flow habitat with adequate cover.

Dads Creek

From the GIS ortho photos, the first approximately 2.0 river miles can be considered low gradient, depositional reaches since the slope is two percent or less. Upstream reaches can all be classified as sediment transport reaches with gradients rising from two percent to nearly 20 percent at the uppermost reach. All of Dads Creek is listed as a 303d stream by DEQ due to high summer rearing temperatures for salmonids.

Recent communications with ODFW fisheries personnel indicated that the first two river miles are often dry below the irrigation ditch from the end of May until mid September and therefore limit late spring through summer passage for steelhead and migratory bull and cutthroat trout. An August stream habitat survey by ODFW in 1969 indicated the first mile of stream was dry and between river mile two and three flows were 0.2 cfs with a morning stream temperature of 60^{o}F (16^{o}C). What was presumed to be a steelhead red was found by CTWS personnel on its land (first river mile) in 2004. No redds have been found in later surveys (2005-7). The first three river miles are adjacent to open grass and farm land, with the grassland interspersed with sagebrush and juniper. The 1969 survey indicated riparian vegetation consisting of willows, alders, cottonwoods, and aspens. In regards fish, dace where common with redband/steelhead present, but few in numbers. Limiting factors within this first three miles are stream flow, stream temperatures, and quality and quantity of pools (1969 surveys indicated 95% riffles). Large wood also appears to be low from viewing ortho photos.

The reach between river mile three and five can be considered a transitional reach in regards to upland vegetation. The 1969 survey indicated a transition from juniper/pine overstory to pine/fir. Streamside cover was identified as deciduous. Flows were 0.3 cfs at the lower end and 0.1 near river mile five. Stream temperatures were constant (60 and 59^{o}F, respectively), though afternoon air temperatures were 70^{o}F during the survey. Redband were common between river mile three and four. The 1969 survey indicated that the reaches surveyed (river miles 1.0 to 6.5) were considered to be a fair steelhead producer. Steelhead designated critical habitat occurs from the confluence of the John Day River to river mile 4.7. Limiting factors for critical habitat include low late spring and summer stream flows, high stream temperature related to canopy cover and flow, and low quantities and quality of large wood for pool creation and cover.

The project area begins at river mile 5.4 and contains 2.6 river miles of fish bearing (category 1 RHCA), 1.0 river miles of perennial (category 2 RHCA), and 10.3 river miles of intermittent (category 4 RHCA) streams. All reaches within the project area are considered sediment transport reaches with slopes ranging from 4.6 to 19.7%. During fall 2007 field surveys, salmonids (likely redband) were found within most pools between river miles 7.7 and 8.4. This survey (between river miles 5.4 and 8.4) also found that the riparian component within the project is dominated by alder followed by willow. Riparian widths are narrow and within steep confined valleys. Due to the narrow valleys with steep side slopes, adjacent upland conifers provide an important source of cover and large wood. As such, large wood and quality pools were not a limiting factor. There was no evidence of excessive fine sediment within the drainages of the project area within the catchment. There was evidence of livestock damage to the bank and over use of the herbaceous component, but it was localized and did not appear to be excessive at the reach level. FS 2600369 road was in poor shape, with heavy rutting and highly connected to the stream in regards to fine sediment inputs. Canopy cover within the RHCAs of the project area averaged from 60 to 70% based on visual estimates from field visits and the ortho photos in GIS. Incised channels were not noted from field visits in regards to deep cuts great than three feet or longitudinal channel confinement greater than a 100 yards. There was no visual evidence of high width to depth ratios and embeddedness did not seem excessive, except for near the FS 2600369 road, which may be attributed to a recent failure of an adjacent irrigation ditch. There is no EFH for Chinook within the catchment and there is unlikely adequate fall flows for bull trout spawning. Species that may be present within the Dads Creek Catchment include an occasional Mid-Columbia River Steelhead, Columbia River Bull trout, and westslope cutthroat trout during wetter periods with above average flows. Inland redband trout are present through out the perennial drainages. Columbia spotted frog may be present in isolated pockets of low gradient pooled areas within the active floodplain and adjacent springs.

Dans Creek

Analysis of GIS ortho photos indicate that the first 1.5 river miles do not appear to follow it historical channel as it appears to be ditched and follow the north valley edge of the John Day River. This reach is channelized with less than 50% canopy cover. Discussions with ODFW personnel from John Day indicate the channel is usually a passage barrier due to lack of flows from May through September. All of Dans Creek is listed as a 303d stream by DEQ due to high summer rearing temperatures for salmonids. The next 2.0 river miles (up to the confluence of Eureka Gulch at river mile

3.5) is a combination of open pasture and narrow bands of riparian woody canopy cover with moderate gradient (3%). There was no evidence of large, mature riparian trees such as cottonwoods. Overall canopy cover appeared to be less than 50%.

The next 2.7 river miles of stream consists of two transition reaches with the adjacent uplands changing from juniper/pine overstory to pine/fir. These reaches are considered to be sediment transport reaches with a combined gradient of 4.8%. The end of the upper reach is 0.12 miles inside the Forest and project boundary and is also the upper most reach of designated steelhead critical habitat (at river mile 6.2). Limiting factors for critical habitat include low late spring and summer stream flows, high stream temperature related to canopy cover and flow, and low quantities and quality of large wood for pool creation and cover. Channel stability and spawning gravel quantity is unknown.

Within the project area of Dans Catchment, there is an additional 0.6 river miles of fish bearing stream (8.1% slope) for a total of 6.8 river miles. There is a total of 4.6 river miles of perennial, non-fishbearing stream (category 2 RHCA) within the project area of Dans Catchment plus 1.4 miles within the catchment below the project area. Gradients for these reaches

Field surveys indicated that there was a lack of pools and embeddedness greater than 30% during the low flow period throughout the perennial portions of Dans Creek due sedimentation and lack of instream large wood. As a result, width to depth ratios were often higher than desired. This may be due to past harvest activity. It was noted from GIS ortho photos that landscape canopy cover as a whole was roughly 50% less within the project area of Dans Catchment than within the project area of Dads Catchment. Riparian canopy cover was low (less than 60%) within Dans Creek. Channel stability was not optimal due to localized bank trampling and ground cover that had been grazed to where the herbaceous vegetative layer can not adequately protect the soil from bankfull events.

Two deeply incised intermittent channels (category 4) were noted along the second perennial tributary of Dans Creek during a field visit. These down-cut intermittent drainages may have been the result of past harvest activities in the uplands north of FS 2600350 and the perennial drainage and concentrated flow from the road. This perennial reach also had poor pool quality due to fine sediment and bank trampling, however cover from adjacent conifers in this confined narrow valley provided greater than 70% canopy cover and adequate large wood. There is no EFH for Chinook within the catchment and there is unlikely adequate fall flows for bull trout spawning. . Species that may be present within the Dans Creek Catchment include an occasional Mid-Columbia River Steelhead, Columbia River Bull trout, and westslope cutthroat trout during wetter periods with above average flows. Inland redband trout have potential habitat but were not found to be present through out the perennial drainages during field visits during the fall of 2007. Columbia spotted frog may be present in isolated pockets of low gradient pooled areas within the active floodplain and adjacent springs.

Eureka Gulch

The mainstem of Eureka Gulch is a tributary to Dans Creek and is perennial (category 2) for its entire length, largely due to Eureka springs at its headwaters. The two reaches with in the project are 2.4 river miles in length and are considered sediment transport reaches with slopes of 6.5 and 12.3%. The 1.4 river mile reach downstream of the project is also a sediment transport reach with a gradient of 5.9%. This reach is also designated critical habitat for steelhead with 0.1 river mile of the reach ending inside the project area.

This drainage has the most disturbance in the RHCA and the least amount of canopy cover (<40%) within the riparian area than any other perennial drainage within the project. Limiting factors include low riparian canopy cover, lack of quantity and quality of pools from fine sediment inputs and absence of large wood, and marginal vegetative buffer (ground cover) from upland erosion. Width to depth ratios and embeddedness are unknown but are assumed to be limiting factors for temperature, spawning, and macroinvertebrate habitat. There is no EFH for Chinook within the catchment and there is unlikely adequate fall flows for bull trout spawning. Species that may be present within the Eureka Gulch drainage include an occasional Mid-Columbia River Steelhead, Columbia River Bull trout, and Westslope cutthroat trout during wetter periods with above average flows. Inland redband trout have potential habitat but were not found to be present through out the perennial drainages during field visits during the fall of 2007. Columbia spotted frog may be present in isolated pockets of low gradient pooled areas within the active floodplain and adjacent springs.

Jeff Davis Creek

The Jeff Davis Catchment has 2.8 river miles of intermittent (category 4) reaches within the project area. Fish bearing, perennial portions of Jeff Davis Creek are 2.6 river miles downstream from the project area and critical habitat for steelhead is 3.3 river miles downstream from the project. The lower reaches of Jeff Davis Creek downstream of the project area contain 2.5 river miles of steelhead critical habitat with riparian canopy cover estimated at less than 60% and low quantities of instream large wood. This was based on visual estimates from GIS ortho photos. Within the project the GIS ortho photos indicated similar riparian canopy cover and large wood as the perennial portions downstream. Landscape canopy cover as a whole was roughly 50% less within the project area of Jeff Davis Catchment than within the project area of Dads Catchment. Fine sediment loads within the Catchment are unknown, along with width to depth ratios and embeddedness. Being similar to the Dans Catchment, it can be assumed these three factors are limiting fro aquatic habitat. There is no EFH for Chinook within the catchment and there is unlikely adequate fall flows for bull trout spawning. Species that may be present within the first 3.3 river miles of Jeff Davis Creek Catchment include an occasional Mid-Columbia River Steelhead, Columbia River Bull trout, and westslope cutthroat trout during wetter periods with above average flows. Inland redband trout have potential habitat but were not known to be present through out the perennial drainages. Columbia spotted frog may be present in isolated pockets of low gradient pooled areas within the active floodplain and adjacent springs.

Dixie Creek

There is approximately 115 acres of prescribed fire and mechanical treatment within the Dixie Meadow Subwatershed. There is one 0.25 river section of an ephemeral drainage within the project and this drainage runs for approximately 3.0 river miles downstream before reaching the confluence of Dixie Creek, a fish bearing, category one RHCA.

Ongoing Actions

Roads Management

There are no present or proposed road management activities outside of scheduled maintenance of level 3 and above roads. Level 2 roads are repaired when damage is reported and if funds are available. FS 2600369, a level 2 road is in need of repair due to direct stream interaction and irrigation ditch damage. The stream is Dads Creek, which is a fish bearing stream.

Range Management

Dear Horn pasture of the Upper Middle Fork Allotment, Standard Creek Pasture of the Dixie Allotment, and the Davis and Danish pastures of the Reynolds Allotment are within the Dads Creek WUI. The range specialist report indicated that aspen groves appear to be diminishing and failing to regenerate. Canopy closure increases in upland areas may be decreasing suitable rangeland forage availability. The number of permitted livestock (stocking rates) may need to be adjusted if riparian use by ungulates (both domestic and wildlife) increases in more open riparian areas.

Timber Management

There are no other large scale timber harvest activities proposed or presently occurring within the Dads Creek watershed. Any forest product activity (hazard tree, poles, wood cutting, Christmas tree cutting, etc.) would be required to meet all PACFISH/INFISH and Forest Plan standards. Timber harvest in the late 1980's and early 1990's reduced canopy cover at the landscape scale for the Dans and Jeff Davis Catchment. This reduced canopy cover appears to be correlated with field observations of greater than natural sediment loads within the perennial reaches of these catchments. Concerns for sediment loads within the Dads Catchment were not observed at the reach level during field visit and correlates with an estimated 50% greater canopy cover for this catchment over Dans and Jeff Davis catchments (aerial photos observations).

Environmental Consequences

No Action Alternative

Effects from natural or catastrophic events such as fire are not actions by the Forest Service. These events are therefore not analyzed as part of Forest Service actions. Present and foreseeable future management actions (no action alternative) should not have any measurable negative impacts or adverse effects to fisheries, riparian areas, or

RHCAs. This is based on meeting present regulations, standards, and guidelines such as PACFISH/INFISH and the Forest Plan (see Regulatory Framework at the beginning of the Fisheries Report). Since there will be no defined new actions, the no action alternative will not have direct, indirect, or cumulative affects to aquatic habitat elements. The elements are defined by PACFISH/INFISH and/or Forest Plan Amendment 29, which include: 1) pool frequency, 2) water temperature/stream shading, 3) large woody debris, 4) bank stability, 5) width to depth ratio, and 6) embeddedness.

Proposed Action

Direct Effects

Upper John Day River

There are no direct effects from the project area to the important aquatic habitat elements as defined by PACFISH and/or Forest Plan Amendment 29, which include: 1) pool frequency, 2) water temperature/stream shading, 3) large woody debris, 4) bank stability, 5) width to depth ratio, and 6) embeddedness. The project area is 5.4 river miles from the John Day River via Dads Creek, 6.0 river miles from the John Day River via Jeff Davis Creek, 4.1 river miles from the John Day River via Dans Creek, and 3.3 river miles from the John Day River via Eureka Gulch. As such, there are no direct effects or impacts to any aquatic species present or their habitat within the John Day River from actions occurring within the project area.

Dads Creek Catchment

There are five category 4s and two to four ephemeral drainages that would have temporary placement of culverts in order to open up closed roads for log haul. These culverts would be removed upon project completion. There are 4.1 miles of roads within Dads Creek RHCAs; of these 2.2 will be used for haul routes. There will be up to 1.9 river miles of fish bearing (category 1) and 4.1 river miles of intermittent (category 4) drainages that will have low intensity fire enter their RHCAs. No steelhead critical habitat is within 0.75 river miles of the project area. There is no Essential Fish Habitat (EFH) within the Dads Creek Catchment.

Possible direct effects from these culvert installations could be sediment inputs, loss of ground and canopy cover, and harassment or harm of aquatic individuals if channel work occurs during flow periods. Of the 19.4 river miles of RHCAs within the Dads Catchment, an estimated 100 ft (20 ft per crossing) or 0.02 river miles of stream may be affected, which is 0.1%. The Best Management Practices (BMPs) identified in the Hydrology Report for drainage work will reduce potential sediment inputs to levels that will not be visually measurable within the reach, vegetative ground and floodplain cover loss will be minimal and should not be measurable at the reach level, and no aquatic individuals will be affected as construction will occur when the channel is not flowing. Herbaceous ground cover will likely return to pre-project conditions within a period of one or two growing seasons. At that time there should be no additional inputs of sediment to drainages within the project area. All drainage sections that are reconstructed on closed roads will be returned to natural conditions following the completion of the proposed action. Natural conditions include channel and bank stability, appropriate width to depth ratio for the type of stream channel, and appropriate ground cover for the floodplain.

Possible direct effects from maintenance of haul roads that cross RHCAs include possible increase sediment inputs to drainages and loss of vegetative round and canopy cover within the RHCAs. Of the 19.4 river miles of RHCAs within the Dads catchment, an estimated 2.2 river miles of RHCAs may be affected, which is 11%. The implementation of BMPs identified in the Hydrology Report for road maintenance will assure that potential sediment inputs to levels that will not be visually measurable within the reach if action, vegetative ground and floodplain cover loss will be minimal and will not be measurable at the reach level.

Possible direct effects to the RHCAs and riparian areas from low intensity prescribed burns include a reduction of ground cover for buffers to upland erosion, potential loss of riparian canopy cover, potential direct inputs of ash into the stream from smoke or erosion, and loss of soil quality in pockets were concentrated fuels cause long periods of burning of soils. Of the 19.4 river miles of RHCAs within the Dads catchment, an estimated 6.0 river miles of RHCAs may be affected, which is 31%. The implementation of the design criteria for Prescribed Fire in within RHCAs will reduce the impacts so that riparian areas will retain nearly all their root structure, less than 15% of the vegetative structure of the herbaceous component will be lost for a given reach, and using appropriate fuel and soil moistures, time of day, and weather conditions in regards to the riparian area will greatly reduce the potential for loss of riparian woody species and protect riparian soil conditions.

Since the present quality of riparian buffers will be retained, and any sediment inputs within the project area will not be measurable within the reach at which they may potentially occur; there will be no significant effects to steelhead habitat or potential individuals of steelhead or bull trout within the catchment. In regards to redband trout and Columbia spotted frog, individuals may be impacted from harassment at crossing reconstruction and prescribed burning activities and smoke from the burns, but the action will not affect the viability of the species.

Jeff Davis Creek Catchment

There are 0.3 miles of roads within the Jeff Davis Creek Catchment RHCAs; of these less than 0.1 will be used for mechanical harvest (haul routs). There will be up to 1.6 river miles of intermittent (category 4) drainages that will have low intensity fire enter their RHCAs. No steelhead critical habitat is within 3.3 river miles of the project area. There is no EFH habitat present within the Jeff Davis Creek Catchment.

Of the 7.3 river miles of RHCAs within the Jeff Davis Creek Catchment, an estimated 0.1 river miles of RHCAs may be affected by road maintenance, which is 1.4%. Potential effects and duration of effects are the same as for the Dads Catchment and the effects would also not be measurable.

Of the 7.3 river miles of RHCAs within the Jeff Davis Creek Catchment, an estimated 1.6 river miles of RHCAs may be affected by prescribed fire, which is 22%. Potential effects and duration of effects are the same as for the Dads Catchment. Since the present quality of riparian buffers will be retained, and any sediment inputs within the project area will not be measurable within the reach at which they may potentially occur; there will be no significant effects to steelhead habitat or potential individuals of steelhead or bull trout within the catchment. In regards to redband trout and Columbia spotted frog, individuals may be impacted from harassment by prescribed burning activities (people) and smoke from the burns, but the action will not affect the viability of the species.

Dans Creek Catchment (including Eureka Gulch drainages)

There are 2.5 miles of roads within the Dans Creek Catchment RHCAs; of these 1.6 will be used for haul routes. There will be up to 0.4 river miles of fish bearing (category 1), 1.8 river miles of perennial (category 2), and 2.8 river miles of intermittent (category 4) drainages that will have low intensity fire enter their RHCAs. Steelhead critical habitat is in the project area for 0.12 river miles on Dans Creek and 0.11 river miles on Eureka Gulch. There is no EFH habitat present within the Dans Creek catchment.

Of the 15.2 river miles of RHCAs within the Dans Creek Catchment, an estimated 1.6 river miles of RHCAs may be affected by road maintenance, which is 11%. Potential effects and duration of effects are the same as for the Dads catchment and the effects would also not be measurable.

Of the 15.2 river miles of RHCAs within the Dans Creek Catchment, an estimated 3.4 river miles of RHCAs may be affected by prescribed fire, which is 22%. Potential effects and the duration of effects are the same as for the Dads Catchment. To assure that effects to the riparian area ground and canopy cover for steelhead critical habitat are not measurable, burning of RHCAs shall not occur within 0.25 river miles of critical habitat. All other effects would be the same as was for the Dads Creek Catchment. Since the present quality of riparian buffers will be retained, and any sediment inputs within the project area will not be measurable within the reach at which they may potentially occur; there will be no significant effects to steelhead habitat or potential individuals of steelhead or bull trout within the catchment. In regards to redband trout and Columbia spotted frog, individuals may be impacted from harassment by prescribed burning activities (people) and smoke from the burns, but the action will not affect the viability of the species.

Dixie Creek

There are no RHCAs that occur within the project area that is in the Dixie Creek Watershed. The distance of the ephemeral drainage to fish bearing habitat is a significant buffer (3.0 river miles) and the size of the action area compared to the subwatershed is not significant (less than 01%). As such the will be no direct effect to any aquatic species within the Dixie Creek Drainage.

Indirect Effects

Upper John Day River

There are no indirect effects from the project area to aquatic habitat elements as defined by PACFISH and/or Forest Plan Amendment 29, which include: 1) pool frequency, 2) water temperature/stream shading, 3) large woody debris, 4) bank stability, 5) width to depth ratio, and 6) embeddedness. The project area is 5.4 river miles from the John Day River via Dads Creek, 6.0 river miles from the John Day River via Jeff Davis Creek, 4.1 river miles from the John Day River via Dans Creek, and 3.3 river miles from the John Day River via Eureka Gulch. Since present conditions indicated the river is adequately transporting sediment, any potential for local inputs of sediment from the project should be effectively absorbed within the tributaries. Also, since there will be no measurable changes in structure or function of riparian areas within the project RHCAs, there should be no measurable change to stream temperatures within the tributaries of the project. Since most of the tributary reaches are in confined channels and there should be no inputs of large wood to the tributaries, and therefore no inputs of large wood to the mainstem of John Day. Pool frequency, width to depth ratios, bank stability, and embeddedness could only be indirectly effect by changes in tributary flows or measurable increases in sediment delivery. There will be no measurable changes of sediment delivery within the tributaries. Therefore, there will be no indirect effects or impacts to any aquatic species or habitat present within the John Day River from actions occurring within the project area.

Dads Creek Catchment

The design of the proposed action was such as to limit the more long term and greater impacts such as construction of temporary roads, mechanical treatments, and prescribed burning of up to moderate intensity to outside of the RHCAs. These buffers should reduce the duration and magnitude the above impacts or effects to be short term, unmeasurable, or non-existent. The following is a discussion of these potential short term, unmeasurable effects or impacts to aquatic species of concern.

Indirect effects from stream crossing reconstruction, road maintenance, and prescribed burns have the potential to increase fine sediment loads to the adjacent drainages if followed by a significant rain event. Herbaceous cover will likely return to pre-project conditions within a period of one or two growing seasons. At that time there should be no additional inputs of sediment to drainages within the project area. Since the inputs to the drainage will not be visibly measurable, the inputs should be absorbed within the reach or adjacent reach from where the potential source may be. As previously stated in the direct effects section for Dads Creek Catchment, sediment inputs will be minimized through the use of BMPs for instream work and road maintenance identified in the Hydrology report. The effects and risk from prescribed fire will also be minimized as stated in the direct effects section through the use of the prescribed fire BMPs.

Though not measurable, potential fine sediment inputs may occur within the reach or adjacent reach of the point of origin. This is especially true when followed by a rain event. Small amounts of fine sediment could affect pool quality, though not likely frequency and embeddedness. As previously stated these potential effects would not likely occur for more than a season or two and could not be visually measurable. As such there will be no significant indirect effects to steelhead, bull trout, redband, or westslope cutthroat trout habitat within the catchment. In regards to Columbia spotted frog, there will be no measurable loss of habitat or quality of habitat Salmonid individuals and the Columbia spotted frog will not be indirectly effect from the action.

Jeff Davis Creek and Dans Creek Catchments

Indirect effects from road maintenance and prescribed burns will have the potential to increase fine sediment loads to the adjacent drainages as was described in the indirect effects for the Dads Creek Catchment. The effect to species and habitat are also the same as for the Dads Creek Catcment.

Dixie Creek

There are no RHCAs that occur within the project area that is in the Dixie Creek watershed. The distance of the ephemeral drainage to fish bearing habitat is a significant buffer (3.0 river miles) and the size of the action area compared to the subwatershed is not significant (less than 01%). As such the will be no direct or indirect effects to any aquatic species within the Dixie Creek Drainage

Cumulative Effects

Upper John Day River

Cumulative effects within the Upper John Day River that may be associated with increased fine sediment caused by road maintenance and construction, livestock grazing, timber harvest, off-road vehicle recreation, agriculture, mining and developed recreational facilities. These effects are often immeasurable at the individual drainage to catchment scale but can sometimes be measurable at the subwatershed to watershed scale.

As previously stated in the description of aquatic habitat within the Upper John Day River, stream temperature and stream flow appear to be affected by conditions throughout the watershed. Since the nature of this project (landscape level alteration of vegetation) can produce measurable increases of fine sediment to streams, it will also be considered as a cumulative effect.

The standard buffer widths used for this project and defined by INFISH, have been shown to adequately maintain appropriate stream temperature inputs to mainstem streams from their associated tributaries. Since the action will not directly or indirectly affect the RHCAs within the project at a measurable level, there should be no measurable cumulative effect to stream temperature from the project within the Upper John Day River. Also, since any local loss of canopy or herbaceous ground cover will be short term (one or two growing seasons) long term cumulative effects will not occur.

Large scale alteration of vegetation can also have cumulative effects to stream flow if there are not adequate buffer widths of healthy riparian vegetation and adjacent upland canopy cover. As previously stated, the RHCAs have been shown to be adequate buffers and any local loss of canopy or ground cover will be short term (one or two growing seasons). There should be no cumulative effects from the proposed action to altered stream flows. This is also in agreement with the Hydrology report.

Increased sediment production from a landscape level alteration of vegetation through timber harvest, thinning, and prescribed burns will likely occur. However, the provision of adequate buffers and implementation of appropriate BMPs and design criteria will reduce the spatial and temporal components of these impacts significantly. The RHCA buffers and the implementation of the Soil and Hydrology BMPs along with the Fisheries prescribed burning design criteria should significantly reduce the magnitude and duration of potential effects to levels the can not be visually measured at areas where concentration of fine sediment may occur within the floodplain. Also, since the present condition of the active floodplain of the John Day River does not appear to be limited from excessive sediment any unmeasurable, short term increase can be adequately absorbed within the river system.

As such, there are no cumulative effects or impacts associated with this project to any aquatic species present or their habitat within the John Day River from actions occurring within the project area.

Dads Creek Catchment

Activities used in the consideration of cumulative effects for the proposed action are identified in Appendix C. Cumulative effects associated from this action as it relates to fisheries and riparian areas include effects to stream temperature, stream flow, and embeddedness related to a potential increase in fine sediments to the drainages. For a more detailed discussion related to the activities listed in Appendix C, see the Fisheries Specialist Report. The following paragraphs discuss potential effects to stream temperature and sediment. There will be no alteration of stream flows based on the Hydrology Report.

Temperature: With no vegetative treatments or prescribed burning in riparian areas, there would be no short term effect on water temperature. Ongoing road maintenance activities located within RHCA's would not reduce existing stream canopy cover sufficiently to adversely affect streamside shading or water temperature. Riparian buffer widths of one site potential tree height are considered to provide greater than 90% effectiveness for stream shading (NRC 1996). Pine site potential trees average 80 ft and Douglas fir average 90 ft (Personal communication, Forest Ecologist). As previously stated, the RHCA buffer widths range from 100 to 300 feet from each side of the channel, which is more than one site potential tree.

Sediment: The activities with the highest potential for affecting sediment input to streams are related to road maintenance, or a lack thereof. Road related impacts most likely to contribute high sediment inputs would be plugged culverts leading to washed out road fills, undersized culverts at stream crossings leading to high water velocities and subsequent erosion at culvert outlets, or sediment channeled on road surfaces and routed through road-side ditches and cross-drain culverts to streams. Under this alternative, there would be no road management activities other than routine road maintenance. This can be considered a no effect, or no change from the existing condition.

Stronghold populations of salmonids are associated with higher-elevation forested lands and the proportion declines with increasing road densities (Quigley et al. 1996). The higher the road density, the lower the proportion of subwatersheds that support strong populations of key salmonids. Specifically, Quigley et al. (1996) shows a strong correlation with road densities of 2 miles/mile^2 or higher and reduction of strong populations of salmonids. Further reductions of strong salmonid populations were identified at densities of 3 miles/mile^2 and 4 miles/mile^2 or greater. Roads in the project area that occur within 100 feet of streams or cross streams commonly impact fish and fish habitat more than roads located in uplands.

Table FI-1 Road/Stream Interaction Information (Proposed Action)

	[1](Public & Private)					
Area	**Total Road Miles**	**Total Road Acres**	**Road Miles within RHCAs**	**RHCA Stream Crossings on FS Roads**	**Road Density Mi/ Mi^2**	**Percent Of Area**
Project Area	60	126/305[2]	7.7	81	5.8	1.8/4.3[2]
Dads Ck. Subwatershed	94	268	- - -	- - -	2.3	0.98
Dads Creek Catchment	47	151	4.5	53	4.1	2.0
Jeff Davis Creek Catchment	17	54	0.3	5	2.3	1.1
Dans Creek Catchment	16	28	2.9	23	2.2	0.6
Total Catchments[3]	80	233	7.7	81	3.7	1.4

[1] Rounding road miles during calculations may result in (0.1) mile discrepancies. This information was derived from the Malheur National Forest GIS.
[2] Second number includes landings at approximately one landing for ever 10 acres and each landing is ¼ acre.
[3] Total catchments do not include the entire subwatershed.

Table FI-2 Haul Roads and Estimated Landings Proposed

Type	Road Miles	Acres	Percent of Subwatershed	Percent of Project
Temporary Roads	1.8	3	0.01	0.04
Closed Level 1 Roads	38.6	66	0.24	0.91
High Clearance Level 2 Roads	10.2	17	0.06	0.24
Level 3 Passenger Vehicles	3.6	7	0.03	0.10
Hwy 26	7.0/1.2[1]	51	0.19	0.02
Total Roads	60.2	144	0.53	0.12
Estimated Landings	- - -	180	0.66	2.5
Total Landings and Roads	- - -	324	1.2	3.9

[1] Second number is the miles of Hwy 26 within the project area of which the percent of project reflects.

Road densities would remain above 3 miles/mile^2 within the project area, Dads Creek Catchment, and Dans Creek Catchment. The percent of road miles within RHCAs are high within the project (11%), Dads Creek Catchment (12%), and Dans Creek Catchment (15%). This alternative would not change road densities or location in the project area. Road densities and roads in close proximity to streams would remain at levels that may negatively impact Dads and Dans catchments.

In summary, there is likelihood of higher than natural levels of chronic inputs of sediments to aquatic habitat from roads within the Dads and Dans Creek catchments. These inputs are not likely to be visually measurable within the drainage or downstream from the drainage.

As such, there are no cumulative effects or impacts related to sediment associated with this project to steelhead, bull trout, redband, or westslope cutthroat trout habitat within the catchment. This would also be true in regards to Columbia spotted frog habitat. Salmonid individuals or populations along with Columbia spotted frog individuals or populations will also not be cumulatively effected or impacted as a result of the proposed action.

Jeff Davis Creek and Dans Creek Catchments

Activities used in the consideration of cumulative effects for the proposed action are identified in Appendix C. Cumulative effects associated from this action as it relates to fisheries and riparian areas include effects to stream temperature, stream flow, and embeddedness related to a potential increase in fine sediments to the drainages. For a more detailed discussion related to the activities listed in Appendix C, see the Fisheries Specialist Report. Se the Dads Creek discussion in regards to potential effects to stream temperature and sediment. There will be no alteration of stream flows based on the Hydrology Report

As such, there are no cumulative effects or impacts associated with this project to steelhead, bull trout, redband, or westslope cutthroat trout habitat within the catchment. This would also be true in regards to Columbia spotted frog habitat. Salmonid individuals or populations along with Columbia spotted frog individuals or populations will also not be cumulatively effected or impacted as a result of the proposed action.

Dixie Creek

There are no RHCAs that occur within the project area that is in the Dixie Creek watershed. The distance of the ephemeral drainage to fish bearing habitat is a significant buffer (3.0 river miles) and the size of the action area compared to the subwatershed is not significant (less than 01%). As such the will be no direct, indirect, or cumulative effects to any aquatic species within the Dixie Creek Drainage or Dixie Meadows Watershed.

Consistency with Direction and Regulations

Malheur National Forest Plan

The proposed Action is consistent with the following applicable MA 3B and PACFISH standards:

- PACFISH RF-2b: Proposed temporary roads and landings are located outside of RHCA's.
- PACFISH RF-3a & b: Roads that will be used for proposed vegetation management activities will have drainage problems repaired and will be brought up to standards prior to haul.
- PACFISH RA-2: Hazard trees felled in RHCA's will be left on site where woody debris objectives are not being met.
- Forest Plan DFC's/RMO's: Activities proposed under the propsed action would not retard the attainment of Forest Plan RMO's for aquatic habitat (LWD, replacement LWD, pool frequency, bank stability, width-to-depth ratio, sediment/substrate, shading, and water temperature). Design elements will be used to minimize the amount of fine sediment resulting from proposed activities.
- Design prescribed burn projects and prescriptions to contribute to the attainment of RMO's (PACFISH Standard FM-4).
- Prohibit storage of fuels and other toxicants within RHCA's. Prohibit refueling within RHCA's unless there are no other alternatives. Refueling sites within a

RHCA must be approved by the Forest Service and have an approved spill containment plan (PACFISH Standard RA-4).

- Locate water drafting sites to avoid adverse effects to listed anadromous fish and instream flows, and in a manner that does not retard or prevent attainment of RMO's (PACFISH Standard RA-5).

- Design fuel treatment and fire suppression strategies, practices, and actions so as not to prevent attainment of RMO's, 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 log-term ecosystem function, listed anadromous fish, or designated critical habitat (PACFISH Standard FM-1).

- 1PACFISH Standard RF-3c & MA 3B Standard 41: Determine the influence of each road on RMOs. Meet RMOs and avoid adverse effects on anadromous fish by closing and stabilizing or obliterating, and stabilizing roads not needed for future management activities. Prioritize these actions based on the current and potential damage to listed anadromous fish and their designated critical habitat, and the ecological value of the riparian resources affected (PACFISH Standard RF-3c). Roads that are causing resource damage to aquatic habitats are proposed for closing or decommissioning (MA 3B Standard 41).

A stream lined roads analysis was conducted in conjunction with this project. It identified roads with erosion problems and other conditions likely to adversely impact aquatic resources. Because the Purpose and Need for this project has been narrowly defined to remove hazardous fuels from the area and manage forest vegetation to reduce the risk of uncharacteristic, severe fire moving from the Forest into private property; the project does include closing 0.7 miles of FS2600369 which were identified in the roads analysis as contributing fine sediments to Dads Creek. Road maintenance, commensurate with use, will vary depending on existing road conditions, season of use and other factors and when accomplished, it would help to ensure that haul roads are kept in an appropriate condition so as to avoid deterioration of conditions and reduce erosion and sediment output from haul roads. Field evaluation shows that some roads currently categorized as closed are no longer closed effectively. Should the proposed action be implemented, on completion of the project, any closed roads that are temporarily reopened would be closed effectively - a minor improvement in adherence to these standards.

Recreational Fisheries (per Executive Order 12962)

Alternative 1 – No Action

Alternative 1 would maintain the current aquatic habitat conditions. The current aquatic habitat conditions are not resulting in reduced recreational fishing opportunities.

Alternative 2 – Proposed Action

Alternative 2 is not likely to impact the quantity, function, sustainable productivity, and distribution of recreational fisheries.

Endangered Species Act

The Endangered Species Act requires the Forest Service to manage for the recovery of threatened and endangered species and the ecosystems upon which they depend. Forests are required to consult with the USFWS or the NMFS if a proposed activity may affect the population or habitat of a listed species.

The following is a summary of effects determinations for the Dads Creek WUI Project.

Table FI-3 Threatened, endangered and sensitive (TES) species considered in the Dads Creek WUI project and the effects determination for the Action alternative.

Aquatic Species	Status	Alt. 2 Proposed Action
Columbia River Bull Trout *Salvelinus confluentus*	T, MIS	NLAA
Mid-Columbia River Steelhead *Oncorhynchus mykiss*	T, MIS	NLAA
Mid-Columbia Steelhead Designated Critical Habitat	D	NLAA
Chinook Salmon EFH1	MS	NAE
Interior Redband Trout *Oncorhynchus mykiss*	S, MIS	MIIH
Westslope Cutthroat Trout *Oncorhynchus clarki lewisi*	S, MIS	MIIH
Mid-Columbia River Spring Chinook *Oncorhynchus tshawytscha*	S	MIIH
Columbia Spotted Frog *Rana luteiventris*	S, C	MIIH
Western Rigid Mussel *Cottus bairdi ssp.*	S	NI
California Floater	S	NI

1Chinook salmon waters are designated Essential Fish Habitat by the Magnuson-Stevens Act.

Federal listing status abbreviations

T - Federally Threatened
S - Sensitive species from Regional Forester's list
C - Candidate species under Endangered Species Act
MIS - Management Indicator Species
D - Designated Critical Habitat
MS - Magnuson-Stevens Act designated Essential Fish Habitat

Threatened and Endangered Species effects determinations abbreviations

NE - No Effect
NLAA - May Effect, Not Likely to Adversely Affect
LAA - May Effect, Likely to Adversely Affect
BE - Beneficial Effect

Sensitive Species determinations abbreviations

NI - No Impact
MIIH - May Impact Individuals or Habitat, but Will Not Likely Contribute to a Trend Towards Federal Listing or Cause a Loss of Viability to the Population or Species
WIFV - Will Impact Individuals or Habitat with a Consequence that the Action May Contribute to a Trend Towards Federal Listing or Cause a Loss of Viability to the Population or Species
BI - Beneficial Impact

Designated critical Habitat effects determinations abbreviations

NE - No Effect
LAA - May Effect, Likely to Adversely Affect
NLAA - May Effect, Not Likely to Adversely Affect

Chinook salmon Essential Fish Habitat effects determinations abbreviations

NAE - No Adverse Effect
AE - Adverse Effect

Magnuson-Stevens Act

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires the inclusion of Chinook salmon Essential Fish Habitat (EFH) descriptions in Federal fishery management plans. In addition, the MSA requires Federal agencies to consult with NMFS on activities that may adversely affect EFH.

Irreversible and Irretrievable Commitments

Irreversible effects are not expected. Reduced population viability for steelhead trout, redband trout, westslope cutthroat trout, Spring Chinook salmon, bull trout, and Columbia spotted frog is not expected. PACFISH/INFISH established explicit goals and objectives for anadromous and inland fish habitat condition and function. By following PACFISH/INFISH standards and guidelines as well as design elements specific to this project, it is believed that irretrievable commitment of this resource can be avoided.

Rangeland

Introduction

Livestock grazing is currently authorized through three Term Grazing Permits on three allotments within the Dads Creek WUI project area. These allotments are: Dixie, Upper Middle Fork, and Reynolds.

Livestock grazing has been a part of the landscape of the Malheur National Forest since the 1860's, when the first miners and homesteaders entered this area. Although livestock grazing on National Forest System lands has decreased since the early 1900s, the ranching industry remains an important part of the Grant County economy.

Livestock are primarily characterized as grazing animals that preferentially select herbaceous vegetation such as grasses and forbs. With the suppression of fire throughout the project area, woody vegetation has dramatically increased. Densely stocked conifer stands limit water and sunlight availability to the herbaceous understory. As a result, many of the allotments within the project area are not as productive for livestock grazing as they once were. In addition, many areas are now so thick with trees of varying age class that livestock have a difficult time traveling through them, resulting in livestock concentration around remaining open meadows or stream corridors.

Regulatory Framework

Laws

The authority to protect, manage, and administer the National Forest System, and other lands under Forest Service administration for range management purposes, is found in the following acts:

- Granger-Thye Act of 1950 – authorizes the Forest Service to issue grazing permits and use grazing receipts for range improvements; provides direction on establishment of local grazing advisory boards and other purposes.
- The Multiple Use Sustained Yield Act of 1960 – establishes the policy and purpose of the National Forests to provide for multiple-use and sustained yield of products and services.
- Forest and Range Renewable Resources Planning Act of 1974 – establishes public land policy and guidelines for the management, protection, development, and enhancement of the public lands.
- Public Rangelands Improvement Act of 1978 – establishes and reaffirms the national policy and commitment to inventory and identify current public rangeland

conditions and trends; manage, maintain and improve the condition of public rangelands so that they become as productive as feasible for all rangeland values in accordance with management objectives and the land use planning process; charge a fee for public grazing use which is equitable; continue the policy of protecting wild free-roaming horses and burros from capture, branding, harassment, or death, while at the same time facilitating the removal and disposal of excess wild free-roaming horses and burros which pose a threat to themselves and their habitat and to other rangeland values.

- Section 8 of the Public Rangelands Improvement Act (PRIA) of 1978 – this section allows for consultation and cooperation in the development and execution of allotment management plans for grazing permits.

- The Rescission Act of 1995 (Public Law 104 – 19) – required each National Forest to establish and adhere to a schedule for completing NEPA analysis and decisions on all grazing allotments within a 15 year period.

Regulations

Regulations governing range management on the National Forests are found primarily at 36 CFR 222. In addition, policy relating to range resources and coordination of range activities of the USDA agencies and other executive agencies, organizations, and individuals is included in the following:

- Secretary's Administrative Order of August 1963, Administration of Lands under Title III of the Bankhead-Jones Farm Tenant Act; Establishment of National Grasslands.

- Departmental Regulation, Number 9500–5 – dated December 15, 1983; Subject: Policy on Range.

Policies

Forest Service's Rangeland Management Manuals and Handbooks.

- FSM 2200 – this manual summarizes laws and regulations governing rangeland management and forest planning.

- FSH 2209.13 – Grazing Permit Administration Handbook

Management Direction

The Malheur National Forest Land and Resource Management Plan (USDA Forest Service 1990) provides general direction, objectives, and goals for the management of forest wide resources.

Forest Goals for range resources: (Forest Plan, pg IV – 2)

- Provide a sustained production of palatable forage for grazing by livestock and dependent wildlife species.
- Manage rangelands to meet the needs of other resources and uses at a level which is responsive to site-specific objectives.
- Permit livestock use on suitable range when the permittee manages livestock using prescribed practices.

Basic management direction is described in the Forest Plan as Management Areas (MAs).

The Forest Plan was amended in 1995 by PACFISH to provide interim direction to maintain management options for anadromous and native fish habitat while the Forest Service developed long-term management strategies.

The Malheur National Forest Post Fire Grazing Interim Guidelines (2007) is an interim providing direction that establishes minimum timeframes that an area would be rested from grazing following a fire (wild and prescribed fires).

Analysis Methods

The analysis area for evaluating rangeland resources is consistent with the project area and has been subdivided following the grazing allotment boundaries to aid in the evaluation process

Rangeland conditions and possible effects of the project were analyzed using information from: forage production estimates, permanent camera points, multiple indicator monitoring, Area 3 Ecologists notes, 2210/2230/2240/2270, 2600 file review, along with the history of the allotments and pastures, past permittee performance & compliance, on the ground knowledge of area, conversations with permittees, professional judgment, team input and literature review. Both positive and negative effects from this proposed project have been examined and are divided into three categories: First, forested understory vegetative conditions; second, riparian vegetative conditions; third, rangeland and allotment management including short and long term costs and benefits, additional management demands, displacement of livestock, forage increases/decreases and improved conditions for herd management along with rangeland improvements and infrastructure.

Existing Condition

This section provides an overview of current existing forested and non-forested rangelands, riparian vegetation resources, and upland forested and as they relate to forage availability for domestic livestock grazing, as well as an overview of allotment management within the Dads Creek WUI Project.

In Area Ecologist Charlie Johnson's notes from the mid 1990s, he characterizes the land within the project area as outside the normal range of variation. He asserts key factors influencing this are based on disturbances that have been either too severe or due to the lack of maintenance disturbance processes. Fire is the element of the ecosystem, which has had the most profound influence on the quality of the plant communities following the intensive grazing period. Where overgrazing was rampant in many parts of the southern Blue Mountains in the first half of the century, the effects of curtailment of fire over time from having its normal cycle of activity in the communities has been pronounced during the past 50 years. He adds the health of the land relates to the incursions by administrative projects to harvest trees. This has been intensive on most areas. The removal of larger trees coupled with removal of fire from the ecosystem has led to promotion of later seral tree species when fire seral tree species were favored in the removal. These plant communities are now far outside the natural range of variation, which effects the overall forest and rangeland health and production (Johnson, 1965).

Forested Understory Vegetation Conditions

The presence of livestock grazing in the watershed can be readily observed in both uplands and the riparian zones. Cover types available to livestock use are primarily Forested Uplands (about 84% of area). Forested upland vegetation, especially mixed conifer types, is considered transitional range, where forage production/quality is closely related to canopy cover and varies greatly over time with seral stage and forest management activities. These communities consist mainly of Warm Dry Upland Forest (Plant Association Group, PAG) with mixed conifer overstories (Douglas fir, grand fir, larch, ponderosa pine) supporting shrub, grass and/or sedge-forb understories. Also present, but less abundant, is Dry Upland Forest (PAG) with ponderosa pine overstory and mainly shrub-bunchgrass understories. Low preference for use of this area by livestock is evidenced at times where forage yields are under-utilized, shading is high from dense canopies (stock prefer open grown forage), slopes are steep or there is more desirable forage elsewhere. Forage available in these forested uplands, depending on site potential, is primarily pinegrass, elk sedge, Ross sedge, western needlegrass, western fescue, Idaho fescue, Junegrass, bluebunch bluegrass, with some shrub use (i.e. bitterbrush, mtn. mahogany, serviceberry) later in the season.

Prior to European-American settlement of this area, fire played a dominant role in shaping the landscape. Current policies of fire suppression have significantly altered the ecosystem. Areas of open park-like stands of ponderosa pine have been converted to dense, overstocked, dead and dying stands of diseased forest which provide little in the way of forage for grazing animals. Conifers have now encroached upon areas that were once open meadows and dry rangeland. Much of the densely stocked forest stands have succumbed to insects, disease and reduced vigor because of over crowding. Where significant tree mortality has occurred, fallen trees often restrict the movement of livestock, thereby further limiting the amount of forage produced and available for domestic livestock.

Understory vegetation in cold forests has probably changed the least of any forest type, since management was initiated. Because of dense canopy cover, understory species tend to be sparsely represented and tolerant of shade. Riparian shrubs are few, except where disturbance has created gaps.

Moist forest supports a more varied and abundant understory that increases wherever light becomes more available. Elk sedge and pinegrass are widespread, along with a number of forbs. Upland shrubs are noticeably sparse and heavily browsed, with little seed set or vegetative reproduction.

Dry forest has generally sustained more alteration of its understory due to the combination of loss of regular fires, past management practices, and current populations of wild ungulates, therefore is the most changed from its historic condition. Native understory grasses and forbs in dry forest environments are adapted to short fire return intervals, and common species such as pinegrass, elk sedge, blue wildrye, tailcup lupine, and heartleaf arnica are stimulated by low intensity burns, especially where adequate light is available. Canopy gaps and a mosaic pattern of forest openings enhance opportunities for the growth of such species of the forest floor. The alteration of natural fire regimes has resulted in uncharacteristically dense shade from the overstory in areas heavily stocked with climax tree species, with a resulting decrease in grass cover and resultant forage availability.

Since most understory shrubs, both riparian and upland, are early seral, they are also dependent on a mosaic forest pattern and overstory gaps to provide the light-rich environment that they need in order to establish. Most are either dependent on top-kill by fire to remove diseased older stems and stimulate regrowth, or require the scarified substrate created by fire to germinate seed. The alteration of natural disturbance regimes in the last 100 years, combined with use by ungulates, has resulted in degraded shrub communities throughout the analysis area.

Native grass and forb species are still predominant in the dry forest, but in areas have been mixed with exotic species introduced to stabilize soils along roads, skid trails, and landing sites, while enhancing domestic livestock forage. Some of these same disturbed locations now host populations of noxious weeds (see Noxious Weeds Report).

Riparian Vegetation Conditions

The riparian vegetation in the project area ranges from cool moist conifer-dominated and moist meadow communities in the upper stream reaches, to mixed conifer/hardwood types in the middle elevation reaches, to grass/sedge dominated communities in the lower elevation wider valley bottoms. Hardwoods (primarily alder) in these upper reaches are generally limited to areas where there are natural or created openings in the canopy. Mid-elevation reaches currently show the most predominant effects of past management activities; lack of fire, historic harvest, livestock grazing, big game browsing and poor road location. These hardwoods often show reduced vigor due to the effects of excessive browsing pressures and lack of natural disturbances such as fire or beaver.

The riparian zone covers only about 4% of the project area. These highly productive bottoms attract livestock because of the high quality forage production that is available season long, the relatively flat terrain, availability of drinking water, and lower temperatures which can occur in drainages protected from the hot summer sun. Livestock prefer the abundance of feed produced in the riparian areas especially after upland feed sources are mature and cured. Several plant association groups are represented in the riparian zone but occur in small acreages such as willow, alder, cottonwood and a variety of forbs/grasses such as bluegrass, reed canary grass, sedges, and rushes.

Wider valley bottoms lower in the watershed sustain wet meadow grass communities consisting of various sedges and rushes. In some areas, native grass species are largely displaced due to a combination of factors including changes in water table levels roads limit the vegetative production and potential along creeks where roadbeds occupy significant portions of the historic floodplains.

Aspen and cottonwood stands are mostly stagnant or decadent due to a combination of human imacts: changes in hygrologic regimes, fire suppression, and intense browsing by unnaturally high popultions of ungulates. Aspen clones occur in isolated small areas of localized high soil moisture, such as riparian zones, ephemerally wet draws, wet meadows, and areas of groundwater seeps. Aspen communities are most commonly found in the mid-elevations around 4500-5500 feet above sea level. The present successional processes have led to diminished patch size and loss of vertical structural diversity. Heavy browsing has exacerbated the stagnant condition of most aspen clones within the Dads Creek WUI Project area.

Rangeland & Allotment Management

Allotments are managed for continued implementation of the Forest Plan, as amended by PACFISH standards and guidelines (GM1-GM4) (or other site specific endpoint indicators as developed through the adaptive management process). Rangeland management strategies based on range science are incorporated into the Allotment Management Plans and Annual Operating Instructions specific to each allotment/pasture and resource needs. The objective behind these strategies is to manage rangeland and riparian resource conditions that meet or are moving toward attainment of desired future conditions. The objectives are met through an ongoing monitoring and adjustment process (adaptive management). The strategies define criteria for modifying grazing operations when progress towards achieving the desired conditions is not being made. Management strategies are subject to change in response to various resource conditions, climate, natural events, listed species, or guidance.

The Dads Creek Wildland Urban Interface Planning Area is located within the boundaries of three active grazing allotments and one inactive allotment on the Malheur National Forest. The Sullens Allotment was closed to livestock grazing through a NEPA decision in 2007. Currently three grazing permittees hold these three ten year Term Grazing Permits. All of these allotments combined are subdivided into 16 pastures and other small holding units. Because the project boundary was not established to correlate with allotment boundaries, they do not exactly coincide and only 4 of the total pastures are located to some extent within the project area. For purposes of management all allotment pastures were included in the following analysis. Pastures within the project area are as follows: the Dixie Allotment contains two pastures, the Reynolds Allotment contains three pastures, and the Upper Middle Fok Allotment has eleven pastures. The following table provides acreage information for the project area as it relates to the specific allotments within in it.

Table RL-1 Range Allotment and Pasture Acreages

Range Allotment: Pasture Name	Pasture Acreage	Project Acres	% Within Project Area
Dixie Allotment			
Standard (total)	12,599	3341	
(NF lands)	7257		
Total	**12,599**	**3341**	**27%**
Reynolds Allotment			
Davis (total)	1109	953	86%
(NF lands)	989		
Danish (total)	6536	2217	34%
(NF lands)	5196		
Total	**7645**	**3170**	**41%**
Upper Middle Fork			
Deerhorn	6997	157	
Total	**6997**	**157**	**2%**

Livestock grazing on these allotments is conducted through commercial cow-calf operations. Permitted cattle are cows with calves and bulls. Calving is completed prior to turnout. Season of use is normally summer until early fall, however, the actual turnout dates are set annually depending on weather and current growing conditions. Closing dates are then determined by either the culminations of the permitted season of use or the realization of utilization standards.

The Allotments within the project area have been grazed by cattle and horses since the creation of the national Forest, however, the present allotment boundaries were established in 1943. Despite the lack of early records on stocking levels in these allotments, it is thought that grazing levels were well above those recommended for maintaining high ecological conditions of the arid or semi-arid rangelands which exist in this allotment. Moreover, livestock handling techniques of the day would have produced relatively poor livestock distribution and continuous use of selected feed areas, hampering recovery of the overstocked range. This degree of livestock use led to structural improvements including fences, gates, cattleguards, handling facilities, livestock travel routes and exclosures which occurred in the1950's. Further projects such as the development of springs for livestock watering helped to improve distribution of livestock in these allotments. Later specific grazing strategies were developed to assist in the development and restoration of grazed landscapes.

These Allotments are primarily defined by three distinct ecosystem types: the northerly slopes are characterized by steep terrain and densely timbered mixed conifer stands with elk sedge understory. The southerly slopes are characterized by a grassland type ecosystem that contains moderate amounts of Sandberg's bluegrass and Bluebunch wheatgrass with scattered Ponderosa Pine overstory and the drainage bottoms are characterized by Meadow types dominated by Kentucky bluegrass

Some photo records lend support to the earlier claim that meadow systems containing bluegrass have become more dominant. Moreover, these systems have an appearance that would indicate Aspen groves are diminishing and failing to regenerate.

Environmental Consequences

Alternative 1 – No Action

Direct and Indirect Effects

No action within the project area would continue to decrease the amount of available forage over time due to the continued encroachment of timber into the rangelands. This will force livestock to concentrate on a continuously shrinking area of suitable rangeland. If more suitable rangeland is not created by future management projects or natural disturbance, the number of permitted livestock (stocking rates) will need to be adjusted to avoid unacceptable environmental effects. This would have a direct negative economic impact on the permittees.

With no action, many of the forested hot-dry and warm-dry biophysical environments will remain outside of the "Historical Range of Variability (HRV), due to overstocked stands that cannot be sustained in the long-term. In absence of fire, forest stand density has increased and vigor has diminished. This diminished health has contributed to more frequent outbreaks of insects and disease epidemics that have further increased the probability of large stand replacing fires.

Fire exclusion in dry forest ecosystems has led to large catastrophic wildfires, increasing the potential for invasion by weeds and further altering ecosystems. These fires result in increased exposure of mineral soil, reduced plant competition, and increased light and nutrient levels-conditions that are favorable to exotic weed species (see Noxious Weed section).

With Alternative 1, structural rangeland improvements and infrastructures along with ecological plots will not be at risk of damage or destruction by management activities and there would be no closures or decommissioning of roads. The current road access to spring developments, salt grounds and fence lines would remain. In the long term, as forest health declines, the abundance of downed logs is likely to present more physical difficulties to livestock grazing operations and decrease access to available forage.

Cumulative Effects

The reasonable and foreseeable future activities in the project area include (but are not limited to) motorized and non-motorized recreation, road construction and maintenance, and resource enhancement projects. Alternative 1, No Action, will not move the project area towards a healthier, resilient, diverse and sustainable ecosystem.

If no action is taken forage quality and production will continue to decline, reducing the quantity of primary, secondary and suitable rangeland over time. There would be a decreased likelihood that the area could be managed in the long term toward open forest conditions, consistent with the historic range of variability. Less forage availability in the upland area would increase use by ungulates (both domestic and wildlife) in more open riparian areas and have potential detrimental impacts to fisheries as well as aquatic resources.

Alternative 2 – Proposed Action

Direct and Indirect Effects

This alternative designed to reduce fire danger, improve forest health and develop vegetation more representative of historic conditions, will positively affect both the short- and long-term range conditions by reducing conifer density in stands, reducing ground fuel loading that restricts livestock movement, and increasing range forage. Adjustments to the proposed action have been made to protect government investments, help resolve resource conflicts, lessen disruption to the ongoing rangeland program, and lessen grazing permittee economic concerns.

Factors including: type of treatment and prescription, size of treatment unit, type of landscape/ecosystem to be treated, and seasonal timing of individual components have been evaluate to lessen the potential for negative effects to the grazing allotments and the permittees.

Higher forage yields and availability on upland sites will result in more available forage to be harvested, held in reserve, or to relieve pressure on riparian zones by better distributing livestock. Due to the large size of the grazing pastures in the planning area, the staggered and varied treatments of this range would not have a measurable influence of the carrying capacity of the range. However forest stand treatments that open up stands previously not accessible to livestock would redistribute grazing effects in a more uniform scope across the pasture.

Access for livestock and personnel would be much better, livestock visibility and herding would be greatly improved. Long-term maintenance costs may be reduced due to improved access along fences and water sources.

Treatments would also reduce and eliminate dead and down woody material and would enable increased livestock distribution resulting in improved utilization of forage, water, and salt. With a projected increase in the quantity of available forage there is increased potential to reduce impacts on riparian herbaceous and hardwood species.

Cutting Treatments (all methods)

Commercial harvesting and precommercial thinning treatments would increase available forage for livestock. The amount of forage increase varies between alternatives depending on the acres treated and type treatment, the more the treatment opens a stand of trees (reduces tree canopy cover) the more availability of sun and nutrients to forage producing herbaceous species. Thus, a shelterwood treatment opens a stand more than a commercial thinning treatment and both of these treatments opens the stand more than a precommercial treatment.

Densely shaded stands opened up by thinning or harvest cuts would allow herbaceous forage production to increase, especially that of pinegrass, elk sedge and dry site bunchgrasses (Idaho fescue, bluebunch wheatgrass). Cover of the palatable shrub, bitterbrush, has no doubt declined in recent years as stands have closed and shade increased. This “light sensitive” shrub should increase after treatment, on environments where it was previously suppressed by shade. Forage production would begin to improve rapidly with the reduction of competition for light, and higher yields may continue for a decade or more depending on light conditions in this range environment. Open grown feed is more palatable. This higher quality forage is preferred by livestock which would attract and encourage more use in open areas. This should improve livestock distribution over the pastures. It may also reduce pressure on riparian zones early in the season, especially if management is used to encourage this action. Livestock management/ herding would be improved with more open vegetation since livestock movement is less restricted and stock are much more visible to ranchers. The anticipated flush in livestock forage production could be a positive impact on the rancher (permittee) economic situation, especially if open stands can be maintained over time, as in historic periods, by future forest management.

Potential negative impacts of the various cutting treatments on local ecosystems and the rangeland resources include the following: meadows, natural grassland openings and previously undisturbed sites, may be impacted if used for piling, landings, temporary access roads and equipment storage. The impacts of these activities have been mitigated by requiring avoidance of these sites. In addition to the death loss of plants impacted by heavy ground disturbance, some sort-term loss of growing space and feed availability to animals will occur where ever heavy slash, thinning debris is piled. Excessive soil disturbance and soil compaction in treatment units from equipment and logging may delay understory recovery.

Mechanical treatment contracts not coordinated with the livestock grazing schedule can adversely affect the livestock program by adding to the traffic/accident potential, altering stock use areas, and possibly affecting the use of gates/fences. Also, there is a risk of loss or damage to range improvements from project activities that may impact these features. There are a number of harvest and thinning units, which are adjacent to or include fences and create a potential conflict if directionally felled trees break the fence or the fence is cut to skid trees. The more a fence is spliced, the less effective it becomes. This is especially a concern if harvest operations are conducted during the grazing season (these fences need to remain intact from May 1 through November 15, more specifically when livestock are on either side of the fence, in order to maintain the livestock grazing system). Design elements are in place to avoid or reduce the likelihood of these concerns to become reality.

Prescribed Burning

Landscape-scale fire spread modeling indicates that strategic placement of fuel treatment areas, specifically designed to interrupt primary fire spread pathways, will reduce the size of large fires as opposed to randomly placed fuel treatments or no fuel treatment. Treating as little as 20% of a landscape in this way can have significant results. Also, when fires burn around or through treated areas, the reduction in burn severity can extend beyond the area treated. Treating in a spatially strategic pattern will increase effectiveness in minimizing large fire spread and buy time to complete treatments on additional areas before they burn (Beighley, 2004).

The vegetation of the Blue Mountains is highly adapted to periodic fire in forest, shrubland and grassland ecosystems and fire was once an integral function of the majority of ecosystems in northeast Oregon. A rest period from grazing after prescribed fire is not anticipated as the majority of the area within the burn boundary supports an understory dominated by rhizomatous grass & sedge, such as pinegrass and elk sedge which are fire resistant and recovery very quickly after fire. Generally speaking, in these communities, pinegrass and elk sedge increase with disturbance. Also, within the project area are other plant communities with understory vegetation dominated by snowberry or grouse huckleberry. Prescribed fire in these plant communities promotes pinegrass, ponderosa pine regeneration and dry site bunchgrasses. Within the grassland and/or bunchgrass dominated understory plant communities prescribed fire helps provide vitality, stimulates grass vigor, promotes bunchgrasses and controls stocking.

Burning impacts on plant species in this project will vary in response to a variety of conditions such as the weather, season of burning, plant morphology, current plant condition and vigor, accumulated litter, soil moisture and ultimately the fire intensity. Fire intensity is probably the most influencing factor that may affect individual plants and create future voids in ground cover throughout the treatment units. The wide variation in burning intensity across treatment units (unburned to light to moderate) will create wide variability in results and recovery. Very low intensity will have light impact, low death loss (good survival), and stimulating effect on vigor after recovery. More fuel, dryer fuel, and longer burning fuel all produce more heat. More death loss is expected with heavier fuel loading, but less local impact where this fuel is spread (as it occurs or scattered). All understory will succumb under scattered heavy slash and at piles, since fire intensity will be severe, and the result may be a short term loss of all understory cover.

Low intensity burn is expected where fuel loads are mostly herbaceous, and there is very little woody material, less than 1 ton per acre as in open grassland with only light shrub cover. When prescriptions call for broadcast burning of scattered fuels, the burning impacts will be wide spread over the unit, with severe burning intensity creating cover voids but with surviving plants interspersed throughout the unit. Bunched slash and piles burned at landings mean certain death of all understory species, but the impact will be more confined, less wide spread over the unit.

Long-term impacts of prescribed burning are anticipated to be positive in terms of moving treatment units towards the historic condition objective and improving both watershed values and production of rangeland resources. Burning “effects” include the release of nutrients which have been tied up in the system so that there is a stimulant (fertilizer affect) on the understory. Recovery of vigor and production in the herbaceous species is quickest for pinegrass and elk sedge, and with low intensity fires, dry site bluebunch wheatgrass and Idaho fescue should be stimulated by the defoliation. However, maintenance of historic-like conditions, long term, will require more follow-up treatment so that shrub recovery may not reach pretreatment levels or dominate understories. Historic conditions on these sites probably did not have heavy shrub cover in many places since fire return intervals thinned the shrub cover repeatedly.

There is a risk of damage to some range improvements if they are not identified in advance and avoided. Fences within or bordering burning units may have fire run through the fence line. Workers may cut and remove fencing for vehicle and worker access. Valuable monitoring study plots (permanent ecological plots, enclosures) may be affected, and special habitats at upland water sources (springs) may be at risk. Design measures provide for protection and/or reconstruction of these structures and monuments. The area ecologist will be notified of any impacts to existing ecological plots or their monuments.

Some areas where the fire is especially hot may need to be rested from livestock grazing. Arrangements will need to be made to provide alternative grazing locations in order to reduce the potential for negative economic impacts to the permittees.

Cumulative Effects

The earliest management activities had the most profound effect on current conditions; many streams within the planning area were affected by grazing. Logging and road building provided livestock increased access to riparian areas and changed the forested area composition to favor less fire resistant species. Fires suppression has maintained this composition.

Actions taking place within the watershed today include: recreation (hiking, camping, horseback riding, off-road vehicle use, fishing, and hunting), prescribed burning, commercial thinning, grazing and associated range improvements and road maintenance and construction. Past actions in or near the project area include timber management, fuel management, fire suppression, grazing, recreation, firewood cutting, big-game management, and road and facilities construction and maintenance. All activities have influenced the current forest composition and structure, and the management infrastructure of the area. Thus, these activities are still reflected, with individual variance, in the current condition of the area's natural resources and human environmental values

Cumulative effects of past, present, and foreseeable actions in association with the proposed action would generally have a positive effect on range availability and livestock distribution in the affected allotments. Commercial thinning and regeneration harvesting in the 1980s and 1990s resulted in small but positive improvement in range forage availability. Proposed commercial harvest, precommercial thinning, and fuel treatments will generally have a positive impact on all range resources reducing the overstory and allowing forage species to increase. All action alternatives would improve livestock distribution, and long-term protection of range improvements.

Past road closures have impacted grazing permittee access for allotment activities. The few roads proposed for closure would have minimal additive impact on grazing permittee access needs. Occasional travel permits on closed roads may be granted to permittees for range improvement maintenance.

Consistency with Direction and Regulations

All alternatives are consistent with Forest wide standards for rangeland resources.

Irreversible/Irretrievable Effects

There are no irreversible and irretrievable commitments of resources that may result from the alternatives with respect to rangeland management.

Invasive/Noxious Weeds

Introduction

The collaborative process raised concerns over the spread of invasive plant species, including noxious weeds. The lands comprising this project on the Malheur National Forest are to be managed to achieve a desired condition as described in the Forest Land and Resource Management Plan (FLMP) and to maintain a healthy ecosystem. Additionally the desired condition requires they are managed so that healthy native plant communities remain diverse and resilient, and damaged ecosystems are being restored.

The Malheur National Forest recognizes and emphasizes the first and most important aspect of invasive/noxious weed management is prevention. The most effective strategy against invasive/noxious weeds is to prevent them from ever being introduced and established. The primary method to the prevention of invasive/noxious weeds is to detect and ameliorate the conditions that cause or favor the presence of competing or unwanted vegetation. Undisturbed or otherwise healthy, vigorous native plant communities are fairly resistant to invasion by weeds. Much of the project area has been actively managed, creating various and many windows of opportunity for invasive/noxious weed introduction and establishment. Numerous invasive plant sites currently exist within or adjacent to the project area.

Once introduced, invasive/noxious weeds interfere with achievement of the desired conditions. Therefore, to achieve the desired condition on the land, invasive/noxious weeds must be managed. Areas of soil disturbance or plant communities of low health and vigor are more susceptible to weed establishment than areas with healthy, diverse vegetation. Simply killing a weed is an inadequate objective in most situations, especially for large scale infestations. Management must foster a healthy, weed-resistant plant community which consists of a collection of species diverse enough to fill all the niches.

Sometimes considered the “second line of defense” after prevention, early detection and rapid response is a critical component of the Forest’s weed management program. When new weed sites are discovered, a quick response can reduce environmental and economic impacts. With limited resources, effective prevention, detection and rapid response must include education of administrative personnel, contractors, permittees, and the public.

Analysis Methods

The analysis area for evaluating existing invasive/noxious weed populations is consistent with the project area with the exception of noteworthy adjacent infestations or infestations in rock source sites and road rights of ways along proposed haul routes. Invasive/noxious weeds will be discussed based on inventoried and known invasive/noxious weed sites that occur in the project area. Invasive/noxious weed surveys have been conducted throughout the Malheur National Forest. All documented weed sites from these surveys are recorded in a National database, Natural Resources Information System (NRIS). The database includes individual site records indicating the location, size of infestation, plant numbers and density, type of past treatment implemented, recommended follow-up treatments and effectiveness. The FACTS database along with weed surveys completed in 2005 were used to identify weed sites within the Dad's Creek Project Area.

Location, site density and size, weed species and characteristics, the potential and rate of spread, along with soil disturbance will be the basis for this analysis. For this project, weed risks were evaluated in the planning stage. Risk includes: the spread of existing weed sites, the introduction of new weeds and the transport of weeds from within the project area to new locations.

Regulatory Framework

Forest Service Strategies, Regulations, and Policies Related to Invasive/Noxious Weed

- Malheur National Forest Land and Resource Management Plan

This analysis is tiered to the Malheur National Forest Land and Resource Management Plan which was amended by the Pacific Northwest Regional Final Environmental Impact Statement for the Invasive Plant Program, 2005, hereby referred to as the R6 2005 FEIS. The R6 2005 FEIS culminated in a Record of Decision (R6 2005 ROD) that amended the Malheur National Forest Plan by adding management direction relative to invasive plants.

- 1988 Record of Decision for Managing Competing and Unwanted Vegetation (1988 ROD) and the 1989 Mediated Agreement

- National Strategy and Implementation Plan for Invasive Species Management

The Forest Service strategy for invasive and non-native invasive plant management.

- National Interagency "Pulling Together" Strategy

A National Strategy for Invasive Plant Management.

- Federal Noxious Weed Act

P.L. 93 – 629, Sec 2, Jan 3, 1975, 88 Stat.2148, and as amended

P.L. 101 – 624, title XIV, Sec 1453, Nov, 8, 1990, 104 Stat. 3611

- Invasive Species Executive Order, Feb 3, 1999

An Executive Order to prevent the introduction of invasive species, provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause.

- Forest Service National Noxious Weed Direction, FSM 2080

Oregon Invasive Weeds Laws

- Chapter 452 – Vector and Weed Control
- Chapter 561 – State Department of Agriculture
- Noxious Weed Quarantine; OAR 603 – 52 – 1200
- Chapter 570 – Plants: Inspection, Quarantine, Pest and Weed Control

Site-specific treatment decisions will be based on location, biology and size of the target invasive plant species, site conditions, and integrated resource objectives. Invasive plant treatment projects will be subject to future National Environmental Policy Act (NEPA) and Endangered Species Act (ESA) analysis before being implemented (R6 2005 FEIS).

The Malheur National Forest does not have an approved invasive plant treatment plan. This has limited control to manual treatments. A treatment analysis is currently underway on the Malheur National Forest. With this analysis, the Malheur National Forest hopes to increase the variety of invasive/noxious weed control methods available for use, including herbicide application and biological control releases for invasive/noxious weed control and management.

Existing Condition

Current weed infestations within the Dads Creek WUI Project area are relatively small in number and size north of Highway 26, south of Highway 26 infestations are widespread and numerous. These known weed infestations are primarily located along roads, old logging units and landings, recreational use areas, rock-pits and other disturbed areas. Some vectors of past and ongoing spread of invasive/noxious plants are:

- Seeds becoming attached to fur of wildlife and domestic livestock as they pass through existing infestations and then falling off at another location.
- Seeds and weed propagules being transported by vehicles and machinery that have been operated in infested area.
- Management actions that disturb soils and reduce competing vegetation therefore making more desirable sites for invasive/noxious weed establishment.

In addition to the above vectors, invasive/noxious weed species can spread via natural vectors such as birds, insects, or wildlife, and natural forces such as wind and water.

Twelve Oregon Department of Agriculture and Grant County listed noxious weed species are known to occur within the planning area. They are found in approximately 100 different locations that total approximately sixteen acres.

The high priority noxious weed species (Grant County “A” Rated) of greatest concern within the Dads Creek WUI Project area are: Spotted knapweed, Diffuse Knapweed, Houndstongue and St. Johnswort. High priority weeds are considered such because they are invasive, persistent, prolific reproducers and are difficult to eradicate once established. They displace desirable vegetation, but presently occur in infestations at scales which are feasible to treat.

Lower priority noxious weeds (Grant County “B” Rated) known to occur within the planning area are Canada Thistle and Dalmatian Toadflax. The “B” rating indicates their present scale of infestation within the county or state is most often unfeasible to treat. In addition, the design measures used to deter the spread and establishment of high priority noxious weeds are effective in the deterrence of lower priority noxious weed species. The present scale of infestations of “B” rated weeds within the Dads Creek WUI project area is feasible to treat, even with the limited methods the Malheur National Forest has available. These lower priority invasive/noxious weeds tend to be less persistent and aggressive than high priority weeds, and may give way to healthy desirable vegetative species over time. On many occasions, low priority weeds are treated in conjunction with high priority weeds. Since these weeds are less abundant on the Forest than other areas of Grant County the smaller infestations are being treated.

The last treatment of known sites occurred in 2005 all sites were again treated in July of 2008

Table NW-1: Known noxious weed occurrence within Dads Creek WUI Project Area.

Common Name	Acres Within WUI
Canada Thistle	1.50
Dalmatian Toadflax	9.48
Diffuse Knapweed	4.05
Houndstongue	0.10
Spotted Knapweed	0.46
St. Johnswort	0.40
Yellow Toadflax	0.11
Grand Total	**16.10**

The Malheur National Forest is presently utilizing manual methods of treating (controlling) non-native invasive/noxious plant species. Therefore treatment emphasis has been on those species with infestations small enough to treat with a limited work force. The methods to remove noxious weeds are grubbing or cutting with hand tools/weed eaters, twice during the growing season. Grubbing uses hand tools to cut stems or tap roots below the ground surface (1-2"). Cutting severs heads from the root above the ground level. Both are effective in controlling or slowing the spread of targeted weed species, however may not be effective methods of eradication. Eradication by this method has been successful only on the early stages of infestation. If necessary, some treatment areas are seeded with annual rye or native grass species if available.

Manual control methods are highly labor intensive and often require repeated treatments within the same or subsequent growing season to be effective. In addition, depending on the site, species, and degree of plant maturity, manual practices may also involve the collection of plant residue by bagging or piling and burning.

As the weed infestations are treated the adjacent areas are monitored to determine if any new invasive/noxious weeds have become established. Infestations are recorded in the FACTS database as they are located. This monitoring takes place annually. The amount of monitoring varies from year to year based on available funding.

Environmental Consequences

Activities Common to All Alternatives

Ongoing Control of Existing Noxious Weeds

Under all alternatives the ongoing invasive/noxious weed prevention and treatment activities would continue, along with implementation of the management direction in the Pacific Northwest Region, Preventing and Managing Invasive Plants Final Environmental Impact Statement and Record of Decision (some of the standards have a longer phase-in period see ROD, Appendix 1 for an implementation schedule for each standard). The current invasive/noxious weed program involves inventory, monitoring, and manual methods through the hand-pulling and clipping of weeds, and use of a gas powered brush cutters.

Alternative 1

Direct and Indirect Effects

While the potential for spread of invasive/noxious weeds under the No Action Alternative is expected to stay the same as found presently, continuing uses of the forest for hunting, grazing, firewood cutting and other recreational purposes along with weed seed transport via natural vectors could contribute to a spread of weeds. Annual monitoring and control measures combined with the relatively small populations should not cause a major increase in invasive/ noxious weed species in the project area. Without disturbance, there would be fewer opportunities for noxious weed introduction and establishment.

However, the No Action Alternative would maintain conditions which pose a risk of future high severity fire. The more severe the fire, the higher the risk of producing favorable conditions for invasive/noxious weeds to spread and establish new infestations. Fire has not been permitted to perform its natural role of frequent under burning, forest stand density has increased and vigor has diminished. This diminished health has contributed to more frequent outbreaks of insects and disease epidemics that have further increased the probability of large stand replacing fires. Without the proposed prescribed (low intensity) burn this process will continue as the interval between fires increases and the fuel loads increases. The lengthening of fire intervals has contributed to fires burning more severely in communities where fire once passed through with less severity owing to lighter fuels. When this area does burn the intensity (severity) of the fire may be more than if it was burned now under more controlled circumstances. By creating conditions favorable to rapid expansion of weeds and removing existing barriers wildfires can set the stage for an unprecedented invasion of new weed species and expansion of established weed species.

Under the No Action alternative present treatment of noxious weeds would continue.

Cumulative Effects

Past and ongoing actions, such as timber sales, fire suppression, livestock grazing, road construction, fire wood cutting, road maintenance, and recreation uses (refer to Appendix D for more information about these actions), have introduced invasive/noxious weed populations within the project area.

There are several foreseeable activities that would occur within the project area which can and do provide a moderate to high probability of the introduction and spread of invasive/noxious weed propagules. These reasonably foreseeable future activities include (but are not limited to) motorized and non-motorized recreation, road maintenance, livestock grazing, firewood, fire suppression, and associated rangeland improvement projects and resource enhancement projects.

The Forest's weed management program consisting of annual surveys combined with mechanical and hand pulling treatments would continue. The amount of treatment, in the project area, will vary annually based on funding and Forest priorities. Upon completion of the Malheur Forest's NEPA analysis and plan for treatment of invasive plants Forest wide, additional weed treatments may occur in the project area.

Alternative 2 - Proposed Action

Direct and Indirect Effects

Alternative 2, the proposed action of the Dads Creek WUI Project is designed to promote a change in species composition and structure to develop healthy, resilient historical vegetation conditions in forested stands while capturing some of the economic value of trees to provide wood products and jobs. The alternative would treat forested stands, using harvest methods to decrease tree density, increase representation of fire-adapted tree species, as well as decrease existing and activity fuel levels. The connected actions will require construction of temporary roads, and maintaining and reconstructing existing roads.

Most activities that disturb or create bare soil and increase light levels create favorable conditions for weed introduction, establishment and invasion. Activities associated with timber harvest, site preparation for planting, road maintenance, and temporary road construction all disturb the soil to some degree. Ground-disturbing activities would increase the risk for spread of invasive/noxious weeds because if seeds are introduced they can germinate more readily than if the soil surface was intact. This weed seed could come from a nearby weed patch, be carried in soil clinging to recreational vehicles, or be introduced and transported from some other source (e.g. birds, animals, water, etc., to mention just a few of the vectors). With the design measures (refer Design Measures in Chapter 2) and monitoring protocols incorporated into this project to reduce invasive/noxious weed spread, the risk of weed propagule introduction and spread due to project activities will be minor. The potential for spread will vary between alternatives as the amount of acres and types of activities proposed varies.

Alternative 2 proposes grapple piling activities. These activities are proposed within some of the areas proposed for commercial harvest in. Heavy equipment is used during grapple piling activities creating some soil disturbance and contact with existing weed sites, increasing the potential for weed spread within treatment areas. Design measures such as cleaning equipment that operates outside the road prism and cleaning of equipment used within known locations of invasive/noxious weed infestations prior to moving to another site would reduce the risk of weed spread.

Alternative 2 proposes varying amounts of precommercial thinning (PCT). PCT operations do not use heavy equipment such as used in tree harvest activities. Thus, there is very little to no soil disturbance expected minimizing the risk of promoting the spread of invasive/noxious weeds. However, as the acres of thinning increases the risk of spreading weeds increases slightly. Alternative 2 proposes 1465 acres of precommercial thinning. As mentioned above, design measures would reduce the risk of weed spread.

Prescribed burning may increase invasive/noxious weed populations. Burned areas do provide nutrients and space for invasive/noxious weeds to establish. However, prescribed fire is expected to be low intensity which reduces the risk of increasing weed populations. Therefore, because low intensity fires are proposed in this project the risk of producing conditions for invasive/noxious weeds increases are minor and certainly less than if the fire was a wildfire. It is expected that when the invasive/noxious weeds are burned the risk of spread in close vicinity to the site is at more risk of weed establishment than an area burned further away. Risk of spread would depend on the differences in resiliency to fire of the weed and surrounding vegetation, soils, and fire intensity.

Increased travel on roadways may increase the spread of roadside invasive/noxious weed sites throughout the planning area, to the planning area from other locations, and from the planning area to areas outside the planning area boundaries. Roads and roadside habitats are particularly susceptible to plant invasions and are primary vectors for the spread of invasive species via natural dispersal or transport by humans or animals. Temporary road construction and road reconstruction would increase the amount of soil disturbance, thus increasing the potential for invasive/noxious weed spread. The larger amount of disturbance due to road related activities the larger the potential for spread. Design measures such as incorporating invasive plant prevention practices during road blading, brushing and ditch cleaning along with monitoring specifically along decommissioned, closed and temporary roads as well as skid trails and landings used during the project, along with other prevention practices, would greatly reduce the risk of spreading invasive/noxious weed due to project activities. In addition, closing and obliterating roads would remove the possibility of weed seed transport via motorized vehicles.

Known weed sites have been identified within the planning area and the locations of their existence in relation to specific sale units. The sites within the general area of units will either first be treated to reduce the potential for weed dispersal or will be avoided by treatment activities.

Although the action alternative adds a disturbance factor that provides a potential risk of noxious weed establishment and spread, Alternative 2, will also provide a potential for an increased level of recognition and reporting of new noxious weed infestations or expansions. Fuels treatment will move the project area towards a healthier, resilient, diverse and sustainable ecosystem. One that is capable of maintaining healthy native vegetation. The abundance of noxious weeds remaining in the project area and the impact they have on other resources will depend upon several variables; implementation of prevention and design measures, the effectiveness of these measures, along the treatment options available and their implementation.

Cumulative Effects

The cumulative effects analysis boundary for the invasive/noxious weeds consists of the Dads Creek subwatershed (approx. 7,100 acres), plus approximately 115 acres of the Dixie Meadows subwatershed (out of 20,116 acres) and less than an acre of the Isham Creek subwatershed (out of 21,610 acres). Cumulative effects associated with Dixie Meadows and Isham Creek subwatersheds are similar to those discussed for Dad's Creek subwatershed and will not be discussed separately. The temporal scale selected for this analysis is from 1981 to 2018: The reasoning for this time scale is supported by:

- Part harvest activities (consisting of various harvesting methods) in the analysis area indicate that the majority of harvest was conducted between 1981 and 1997.

- The future planned activities proposed by the Malheur National Forest are, in general, on a 10-year planning cycle.

A comprehensive list of potentially cumulative actions considered for this project is presented in FEIS Appendix C.

Past actions such as timber sales, fire suppression, livestock grazing, road construction, fire wood cutting, road maintenance, and recreation uses (refer to Appendix D for more information about these actions), have increased invasive/noxious weed populations within the project area.

The potential for invasive/noxious weed spread is expected to increase in the short term due to the proposed activities. Proposed design measures listed in Chapter 2 will help reduce the magnitude of spread. Post-project surveys of the area annually for 1 to 5 years would provide for early detection and treatment if weeds should establish in the project area.

The Forest's weed management program consisting of annual surveys combined with mechanical and hand pulling treatments will continue in the future. The amount of treatment, in the project area, will vary annually based on funding and forest priorities. Certain invasive/noxious weed populations will continue to expand, regardless of the alternative chosen, due to natural increase of existing populations from all the complex ways these species are spread. However, other species that occupy limited area (plus other species that are not yet here) will be managed to the extent possible to stop the spread by the forest's weed management program.

Cumulatively there are several activities that occur within the project area which can and do provide a moderate to high probability of the introduction and spread of invasive/noxious weed propagules. These reasonably foreseeable future activities include (but are not limited to): domestic live-stock grazing, mining, motorized and nonmotorized recreation, road construction and maintenance, and resource enhancement projects. As identified in the Range Resources Report for the Dad's Creek Project, all action alternatives could increase the level of accessibility and use by domestic livestock (as well as wildlife and recreationists), increasing the transport of weed seeds by these vectors. This increased accessibility could result in cumulative spread of invasive/noxious weeds.

Upon completion of the Malheur Forest's NEPA analysis and plan for treatment of invasive/ noxious plants Forest wide, additional weed treatments may occur in the project area. A proposed action has not been developed to date, therefore possible treatment methods, species, site locations, and acres are not known at this time.

Existing noxious weed populations may continue to spread onto adjacent or intermingled private and other agency lands; similarly, populations from other-ownership lands will continue to spread onto the Forest. Both conditions require coordination with country weed and pest offices to manage populations and their effects regardless of land ownership and property boundaries.

Application of the design measures in the planning of all future projects within the area under analysis are expected to substantially reduce noxious weed spread and establishment through vectors controlled and administered by the Forest Service.

Consistency with Direction and Regulations

All alternatives are consistent with Forest wide standards for invasive/noxious weeds, including Forest plan modifications made by the Pacific Northwest Region 2005 Invasive Plant Program FEIS and Record of Decision.

Irreversible and Irretrievable Commitments of Resources

There are no irreversible and irretrievable commitments of resources that may result from implementing the alternatives with respect to invasive/noxious weed management.

Botany

Introduction

This Biological Evaluation analyzes the potential effects for the Dads Creek Wildland-Urban Interface Project. This document satisfies the requirements of Forest Service Manual 2672.4 that requires the Forest Service to review all planned, funded, executed or permitted programs and activities for possible effects on proposed, endangered, threatened or sensitive species.

The objective of this evaluation is to understand how actions or lack of action will impact habitat and viability of these plant populations and how to reduce or avoid adverse impacts. The type of actions, scope of present, future, and past activities, and duration of activities, influence the size of impacts to these uncommon plants.

Project Area Baseline Conditions

Elevations within the project area range from 4,800 feet near the south and western boundaries, to approximately 6,000 feet along the north east and eastern edge of the watershed. Much of the watershed lies on slopes ranging from 30 - 70%. Drainages are generally narrow and steep at upper elevations and are aligned in a slightly southwest to southerly direction leading into the main stem of the John Day River.

Surveys and Analysis

Potential sensitive species habitat was surveyed during the 2007 field season. No sensitive plants were documented within this project area, although potential habitat was noted for 12 species (Table B-1 Effect Determinations).

Effects to habitat or individuals or populations are addressed under the Proposed Action assessment.

Status of Species, Habitat, and Effects Summary

The following table displays the status of species and habitat within the project area, and effect findings for species suspected or documented on the Blue Mountain Ranger District and are contingent upon implementation of mitigation measures, identified in Chapter 2.

Table B-1 - Effect Determinations

Sensitive Species	Occurrence in Project Area	Habitat Status Within Project Area	Alt 1 No Action	Alt 2 Proposed Action
Achnatherum hendersonii	Henderson's ricegrass	Not Found	Present	MIIH
Achnatherum wallowensis	Wallowa ricegrass	Not Found	Present	MIIH
Astragalus diaphanus var. diurnus	South Fork John Day milkvetch	Not Found	Not Present	NI
Astragalus tegetarioides	Deschutes milkvetch	Not Found	Not Present	NI
Botrychium ascendens	upswept moonwort	Not Found	Present	MIIH
Botrychium crenulatum	crenulate moonwort	Suspected	Present	MIIH
Botrychium lanceolatum	lance-leaf moonwort	Not Found	Present	MIIH
Botrychium minganense	Mingan moonwort	Not Found	Present	MIIH
Botrychium montanum	mountain moonwort	Not Found	Present	MIIH
Botrychium pinnatum	pinnate moonwort	Not Found	Present	MIIH
Calochortus longebarbatus var. peckii	long-bearded sego lily	Not Found	Not Present	NI
Camissonia pygmaea	dwarf evening primrose	Not Found	Not Present	NI
Carex backii	Not Found	Suspected	MIIH	MIIH
Carex idahoa	Idaho sedge (formerly C. parryana)	Not Found	Present	MIIH
Carex interiorinland sedge	Not Found	Present	MIIH	MIIH
Cypripedium fasciculatum	clustered lady slipper	Not Found	Not Present	NI
Dermatocarpon luridum	silverskin lichen	Not Found	Not Present	NI
Leptogium burnetiae var. hirsutum	hairy skin lichen	Not Found	Not Present	NI
Listera borealis	northern twayblade	Not Found	Not Present	NI
Lomatium erythrocarpum	redfruit desert parsley	Not Found	Not Present	NI
Lomatium ravenii	Raven's lomatium	Not Found	Not Present	NI
Luina serpentina	colonial luina	Not Found	Not Present	NI
Mimulus evanescens	vanishing monkeyflower	Not Found	Not Present	NI
Pellaea bridgesii	Bridge's cliff-brake	Not Found	Not Present	NI
Phacelia minutissima	least phacelia	Not Found	Suspected	MIIH
Pleuropogon oreganus	Oregon semaphore grass	Not Found	Not Present	NI
Thelypodium eucosmum	arrow-leaved thelypody	Not Found	Not Present	NI

[1] MIIH – May impact individuals or habitat but not expected to affect viability.
NI – No impact

Regional Forester's Sensitive Species List (Update): On January 31, 2008, Regional Forester Linda Goodman released an updated Sensitive Species List which includes federally listed, federally proposed and sensitive species lists.

In the cover letter for the updated species list the Regional Forester states that projects initiated prior to January 31, 2008 may use the updated sensitive species list or the list that was in effect when the project was initiated. The Responsible Official for the project has authority to decide which list to use. “Initiated” means that a signed and dated document such as a project initiation letter, scoping letter, or Federal Register Notice for the project exists.

The Dads Creek Wildland Urban Interface Project was initiated and field surveys were conducted in 2007. Consequently, the 2004 Regional Forester Sensitive Species list in effect at that time was used for field reconnaissance and this Biological Evaluation.

Pre-Field Review

A pre-field review is used to determine the likelihood that TEPS species, or their respective habitats, are located within or adjacent to the project area. Information from the pre-field review, in conjunction with the project description, is used to determine the need and intensity of field surveys and, in part, fulfills the standards and procedures for conducting a BE.

The following sources of information were used to determine which TEPS species, and their respective habitats, occur or may occur within or near the project area:

- The Regional Forester’s Sensitive Species List (USDA Forest Service, 2004).
- Malheur National Forest sensitive plant species database and Geographic Information System (GIS) layer, and other pertinent GIS mapping layers.
- Sensitive Plants of the Umatilla and Malheur National Forests (USDA Forest Service, 2006).
- Flora of the Pacific Northwest (Hitchcock and Cronquist, 1973).
- Field Guide to Intermountain Sedges (Hurd et al., 1998).
- Environmental Assessment for the Genesis Demonstration Project (USDA Forest Service, Prairie City Ranger District, Malheur National Forest, 1992).
- Available literature, reports, conservation plans, and species descriptions on file at the Malheur National Forest Supervisor’s Office.
- Project maps and aerial photographs provided by the Project Leader and/or Project Interdisciplinary Team Leader.

Results of this Pre-field Review:
Documented occurrences of TEPS plant species within the project area: None

Project proximity to known TEPS plant populations: Carex interior is documented in the Clear Creek drainage three to four miles east of the project area. Botrychium crenulatum and Botrychium lanceolatum are documented in the upper Davis Creek and Placer Gulch drainages approximately one mile northeast of the project area.

Surveys were conducted for Oryzopsis hendersonii (now Achnatherum hendersonii) in 1992 for the Genesis Demonstration project south of Highway 26 (Prairie City Ranger District). No plants were located at that time.

Field Surveys

Field surveys were completed during July and early August, 2007, with additional follow-up visits in October, 2007 by Cynthia Kranich, Acting District Botanist, Blue Mountain Ranger District. Surveys were performed within areas considered to have potential habitat. No sensitive plants were documented within this project area, but heavy grazing pressure in some seeps and springs precluded identification of plants due to trampling and removal of above- ground vegetation and seed heads.

Twelve sensitive plant species have potential habitat within the analysis area: *Achnatherum hendersonii, Achnatherum wallowensis, Botrychium ascendens, Botrychium crenulatum, Botrychium lanceolatum, Botrychium minganense, Botrychium montanum, Botrychium pinnatum, Carex backii; Carex idahoa; Carex interior,* and *Phacelia minutissima*.

Description of Affected Species and Effects Analysis

In this section, the effects determination is given for the Proposed Action or the No Action alternative for species with similar habitats. Individual species descriptions and effects discussions follow.

Effects Determination for Plant Species Associated with Dry Habitats

These species are found in rock outcrops, talus slopes, rocky scabs in ponderosa pine stands, or grass steppe habitats.

Table B-2 Species Found on Rocky or Grass Steppe Areas

Sensitive Species	Common Name	Federal Status:	State Status:	Region 6 Status:
Achnatherum hendersonii	(Henderson's ricegrass)	none	Candidate	Sensitive
Achnatherum wallowensis	(Henderson's ricegrass)	none	none	Sensitive
Carex backii	(Back’s sedge)	none	Candidate	Sensitive

Proposed Action

Project impact to this habitat group is low or limited since these plants inhabit non-forested or sparsely forested habitat. The Proposed Action may impact individuals or habitat, but should not contribute to a trend towards federal listing or cause a loss of viability to the species.

Achnatherum hendersonii, A. wallowensis (Henderson's ricegrass)

Environmental Baseline

Since both species occupy similar habitat, they are treated together in this document under the common epithet of Henderson's ricegrass. Ponderosa pine and grass-steppe habitat does occur at lower elevations within the project area. No plants of either *Achnatherum hendersonii* or *A. wallowensis* were located.

Henderson's ricegrass is a strongly tufted perennial that has been found on the Ochoco National Forest at elevations from 4100 to 5400 ft. It reproduces from seed, and known populations contain few plants. Its range is east of the Cascades from central Washington to the Wallowa Mountains of northeast Oregon.

This grass is found in dry, rocky, shallow soil, in association with sagebrush or ponderosa pine, although some sites have been found in scablands with no overstory. It has been found in *Artemisia rigida - Poa secunda* plant associations, as well as *Eriogonum strictum - Poa secunda* plant communities. Other associated plants include species of *Lomatium spp., Elymus elymoides, Trifolium spp.,* and *Zigadenus spp*.

Direct Effects and Indirect Effects

It is unlikely that potential habitat will be affected by burning as scablands support too little vegetation to carry a fire.

Use of scabland areas by vehicles and heavy equipment during management activities could damage potential habitat by soil compaction and ground surface disturbance.

Cumulative Effects

Historic use of scablands for yarding and log landings has removed and reduced native vegetation, compacted soils, and altered runoff and moisture retention patterns on some potential habitat. Grazing, which is likely to remove the seed crop as well as impact individual clumps, is the greatest threat to these species' survival. There is ample evidence that another ricegrass, *Achnatherum hymenoides*, a native American food source, was far more abundant in the Blue Mountain/Great Basin ecosystems before the introduction of European cattle (Murphey, 1959). It seems likely that the same may have been true for these two local endemic species, since their preferred habitat has historically seen heavy grazing.

Carex backii (Back's sedge)

Environmental Baseline

There is scant information on this species on the Malheur National Forest. The only documented report of Back's sedge on the Malheur is on very different habitat from other documented populations on the Wallowa-Whitman National Forest. On the Emigrant Ranger District (Malheur National Forest) this species has been found on a terrace above a stream in association with ponderosa pine, common snowberry (*Symphoricarpos albus*), and scattered Douglas-fir, but generally in less shrubby areas of this plant association. At higher latitudes the preferred habitat of this sedge species is lowland to mid-montane sites that show substrate movement on steep slopes or are closely associated with rock outcrops. On the Wallow-Whitman National Forest it has been found in dappled to deep shade and includes a shrub component or are within ponderosa pine forests on rocky ridge tops, or growing in proximity to basaltic rock outcrops. Associated species include red alder (*Alnus rubra*), red osier dogwood (*Coses sericea s. sericea*), mountain alder (*Alnus incana*), other dry land sedges, and old man's whiskers (*Geum triflorum*).

The flowering period is July to August.

Direct Effects and Indirect Effects

No populations of the Back's sedge have been found within the analysis area, but potential habitat may exist.

Ground disturbing activities, such as use of logging equipment or fireline construction, would be detrimental to the species and habitat, however, such activities are not likely to occur within close proximity to riparian habitat or rocky outcrops.

Cumulative Effects

Past road building, yarding and log landing use may have reduced habitat by changing water availability. Invasive species such as red top (Agrostis stolonifera) and Kentucky blue grass (Poa praetensis) have invaded from riparian areas and may be the most serious threat this species.

Effects Determination for Plant Species Associated with Seasonally Moist Habitat

These species are found in isolated areas where localized moisture is only available in the spring and are found within forested stands, veratrum meadows, or grass - steppe habitats.

Table B-3 Species Found on Moist Habitat Areas

Sensitive Species	Common Name	Federal Status:	State Status:	Region 6 Status:
Carex idahoa (formerly Carex parryana)	Idaho sedge	none	none	Sensitive
Phacelia minutissima	least phacelia	Species of Concern	Candidate	Sensitive

Proposed Action

The proposed activities could impact individuals or habitat. Activities would not contribute to a trend towards federal listing or cause a loss of viability to either species.

Carex idahoa (Idaho sedge)

Environmental Baseline:

No populations of *Carex idahoa* have been found within the analysis area, although there are areas of potential habitat.

This sedge is loosely tufted that grows from lowlands to moderate elevation. Its range is chiefly east of the continental divide but it extends onto the Pacific slope in central and east Idaho and northern Utah; it is also known from northeast Oregon and central Nevada.

Carex idahoa grows in the driest communities of moist meadows, swales, and moist, low ground around streams and lakes, and on prairies and high plains as well. Associated plants found on a wetland classification plot on the Emigrant Creek Ranger District were *Poa pratensis, Agrostis stolonifera, Juncus balticus*, and *Carex praegracilis. Carex idahoa* can reproduce via creeping rhizomes, and by seed production. Because it is wind-pollinated, it requires no pollinator insects.

Direct, Indirect, and Cumulative Effects

Because of its habitat, *Carex idahoa* is not likely to be affected by logging or thinning activities, as long as vehicles and machinery avoid meadows and moist ground around streams.

There is no information about the effects of fire on *Carex idahoa*. Because it grows in the driest associations of moist meadows, its habitat could be affected. If a fire is low to moderate in severity, the creeping rhizomes will probably survive and sprout after the burn. This sedge's overall habitat would probably not be negatively affected by low intensity prescribed burning, especially fall prescriptions.

Noxious weeds, knapweeds in particular, can spread rapidly in this species' preferred habitat. Knapweed heavily infests many of the roads within the project area south of Highway 26.

Cumulative Effects

Historic heavy grazing, including late season use that removed the seed crop may have reduced occurrences of this sedge in NE Oregon.

Lowered water tables associated with stream channel degradation, and the loss of beaver created wetlands may have reduced potential habitat.

Phacelia minutissima (least phacelia)

Environmental Baseline

No populations of *Phacelia minutissima* have been found within the analysis area, although potential habitat is present.

Phacelia minutissima is a regional endemic of the Pacific Northwest, found in Oregon, Washington, Idaho, and Nevada. It grows at moderate elevations (5000 to 7000 feet) in the mountains, in micro-habitats that are at least vernally moist. It is known from the Wallowas, from the Aldrich Mountains, and from one upland site, near upper Camp Creek, a tributary to the Middle Fork John Day River and west of the project area.

According to Atwood (1996), least phacelia grows along streambanks in sagebrush communities and in aspen stands. In the Blue Mountains it occurs in association with *Veratrum californicum* (false hellebore) and *Wyethia helianthoides* (white mules ears) in vernally moist meadows and small scablands that are common throughout the forest. In currently known sites, it exists in relatively disturbed habitat where its greatest threat may be invasion by exotic plant species such as *Lotus corniculatus* (birdsfoot trefoil).

Populations of least phacelia are most abundant in wet years, though its diminutive size, along with its annual life cycle, makes this plant difficult to locate. For this reason it is possible that it is more widespread than current records indicate. The first population to be found in the Middle Fork John Day watershed was documented in summer, 2001.

Direct and Indirect Effects

Timber harvest activities have little effect on least phacelia as long as they avoid wet meadows and riparian habitat. Meadows supporting *Veratrum californicum* (California false hellebore) should be avoided with vehicles and heavy equipment, even if they dry out late in the season.

Prescribed fire allowed to creep is not likely to adversely impact favored habitat if conducted in the fall. Wet meadows and scabs supporting least phacelia should be avoided by heavy foot or ATV traffic in spring. Burning through these areas early spring would likely not be possible because of moisture and lack of flammable vegetation. Because the population documented in the upper Camp Creek area has continued to produce new plants after various disturbances, proposed activities would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species .

Cumulative Effects

Historic heavy grazing and overuse of riparian zones and meadows, as well as invasion by weeds, may have reduced the extent and abundance of least phacelia throughout its range, and may have degraded potential habitat as well. While it can exist in areas of moderate disturbance, its survival on severely impacted soils is in question.

Effects Determination for Plant Species Associated with Riparian Habitat

These seven species are found in perennially moist ground at the edges of riparian areas, including bogs and wet meadows, seeps, springs, or streams.

Table B-4 Species Found on Riparian Habitats

Sensitive Species	Common Name	Federal Status:	State Status:	Region 6 Status:
Botrychium ascendens	ascending moonwort	Species of Concern	Candidate	Sensitive
Botrychium crenulatum	crenulate moonwort	Species of Concern	Candidate	Sensitive
Botrychium lanceolatum	lance-leaf moonwort	None	None	Sensitive
Botrychium minganense	Mingan moonwort	None	None	Sensitive
Botrychium montanum	mountain moonwort	None	None	Sensitive
Botrychium pinnatum	pinnate moonwort	None	None	Sensitive
Carex interior	inland sedge	None	None	Sensitive

No Action

Because the no action alternative may increase vegetation susceptibility to high intensity fire, it may adversely impact *Botrychium* species by affecting habitat: by removing shade, damaging rhizomes, or reducing or temporarily eliminating necessary mycorrhizal associations. However, no action will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Proposed Alternative

Riparian areas, seeps, and springs should be avoided by vehicles and all off-road equipment and logging activity. While *Botrychium* plants were not located during the survey period, habitat exists in several drainages and seeps within the project area. Prescribed fire allowed to back into riparian areas may impact individual plants, but as long as fire intensity is low, impact to surrounding habitat and overstory trees and shade should be minimal.

Proposed activities should have minimal impact on individuals and will not likely contribute to a trend towards federal listing or cause a loss of viability to the species.

Botrychium Species

None of the six *Botrychium* species have been documented within the project area, however two species are documented in similar habitat in adjacent drainages northeast of the project area. In this evaluation, all *Botrychium* species with occurrence potential on the district are treated under a single analysis because they have common habitat requirements and are frequently found growing together.

Environmental Baseline:

Botrychiums, also known as moonworts, are small primitive plants closely related to ferns. They reproduce by spores, and are known to be mycorrhizal, though many details of their life history and growth requirements are still unknown. Although green and apparently photosynthetic, the species considered here are all capable of surviving for years with only sporadic above-ground growth, apparently drawing reserves from the host plants with which they have mycorrhizal connections. As a result, populations of these moonworts appear to fluctuate from year to year, depending on how many plants produce visible leaves and/or fruiting bodies. The factors determining yearly growth are not yet understood.

These six *Botrychium* species are found sporadically throughout the mountains of the Pacific Northwest and the Rockies, and *B. minganense* is known across Canada to the eastern part of the continent. In the Blue Mountains they have primarily been found between 5000 and 7500 feet elevation.

Preferred habitat of these species is perennially moist ground at the edges of small streams, wet meadows, springs, and small seeps within forest openings. It should be emphasized that even the smallest spring or seep provides good potential habitat, especially above 4500 feet elevation.

Plants often favor shade from an overstory of conifers or riparian shrubs such as alder and red-osier dogwood, but also occur in openings or meadows with only grasses and forbs providing shade. Wet meadow edges with encroaching lodgepole pine are prime habitat sites, as are the mossy openings around springs in mixed conifer forest that includes sub-alpine fir and Engelmann spruce. On the Umatilla National Forest several *botrychium* species are found under young spruce in moist tree plantations that are 20 to 40 years old. Plants frequently associated with *botrychiums* in the Blue Mountains include strawberries and violets, *Pinus contorta, Picea engelmannii, Alnus incana, Vaccinium scoparium, Carex aurea, Geum macrophyllum, Hypericum anagalloides, Mimulus moschatus, Orthilia secunda, Platanthera dilatata, Ranunculus uncinatus*, and other *botrychium* species.

In many instances, moonworts appear to be "seral" species favored by one-time ground disturbance, tending to appear 10 years or more after such disturbance occurs. It is possible that they die out eventually, as forest succession shades out understory plants. A mosaic of forest habitats that shift over time, providing new openings as old ones fill in, may best ensure the long-term survival of botrychiums. However, until this is definitively known and the needs of these moonworts are better understood, it is important to preserve existing populations. Since most of the plants are quite small and are difficult to find, they may be easily overlooked except in intensive surveys. Their habitat, on the other hand, is readily identified and protected or avoided during management activities.

Direct and Indirect Effects

Ground disturbance, such as soil disruption by logging and yarding activities, would reduce the quality of habitat, and could disrupt needed mycorrhizal connections, and cause direct mechanical damage to above-ground plants during the growing season. Loss of individual above-ground stems, by herbivores, unseasonable frost, or mechanical damage, may not harm plants in the long run, considering that they do not appear above ground every year, and probably rely on nutrients obtained from the mycorrhizal connections to persist.

Along with ground disturbance, changes in moisture availability such as loss of ground water sources or hydrological changes, are probably the most potentially damaging to moonwort populations. While existing plants may have the capacity to survive droughty periods through their mycorrhizal connections, germination and establishment of new plants require ample moisture.

The effects of fire are not known. Because moonworts are limited to very wet microhabitats in the Blue Mountains, they are unlikely to be directly affected by fire, unless it is severe. However, the death of overstory trees due to burning may remove a necessary mycorrhizal host and impact an entire population, as in those that grow at the edges of meadows around small lodgepole pine. Loss of the shade that many populations favor could also affect long term survival of these species. It is not known what consequences such fire effects might have, or whether an existing population could persist under these circumstances.

Because sites capable of supporting *botrychiums* are usually classified as riparian, they should not be affected by harvest activities. For the same reason, low intensity prescribed fire is unlikely to damage potential habitat or any plants that may be present. Because the six sensitive species considered here have a broad distribution on the continent, possible impacts to individuals from this project would not jeopardize the survival of the species as a whole.

Cumulative Effects

Loss of undisturbed wet sites capable of supporting *botrychiums*, whether due to water "developments" for livestock, water uses, or to upstream, upslope hydrologic disturbance can most effectively eliminate potential habitat. The Forest Plan, as amended by PACFISH, should adequately protect potential habitat.

Carex interior (interior sedge)

Environmental Baseline:

Interior sedge has not been documented within the project area but potential habitat probably exists in wet meadow openings along streams as well as less shaded bogs, seeps, and springs.

Carex interior is a densely tufted sedge that grows in lowland to mid-montane elevations. It is a widespread North American species found throughout the range of the Pacific Northwest, as defined by Hitchcock and Cronquist; however, it is apparently uncommon in Oregon. It is known to inhabit saturated riparian areas with year-round surface water. It thrives in full sun, but can survive with small amounts of shade. Associated species include *Alnus incana, Carex cusickii, Carex utriculata, Cicuta douglasii, Deschampsia cespitosa, Juncus spp*., and *Menyanthes trifoliata*.

Direct and Indirect Effects

Inland sedge grows in very wet habitats that are unlikely to be affected by prescribed fire. If fire did creep into an area where this sedge grows, it would likely only affect the above ground portions of the plant. The rhizomes embedded in wet mud can probably survive all but the most severe fires, allowing the plants to resprout rapidly after a burn.

The use of heavy equipment associated with logging and road construction can harm fragile, wet soils on which *Carex interior* grows. Because of its location in wet areas, its habitat is protected from mechanical disturbance by Forest Plan standards.

Cumulative Effects

Canopy closure and dense shade from conifers resulting from years of fire suppression may well have reduced potential habitat, and may have caused existing populations to shrink.

Heavy domestic livestock grazing and wild ungulate use may have decreased the abundance of this sedge across the landscape. Like other sedges, *Carex interior* remains palatable fairly late in the summer and may become preferred forage when other plants are drying and late season grazing can remove the seed crop, negatively impacting this species' reproduction. Excessive use by ungulates can also harm the fragile, wet soils this sedge inhabits.

Water developments such as cattle troughs and ditches for irrigation have decreased wet meadow habitat. Lowered water tables associated with stream channel degradation and loss of beaver wetlands has also reduced wetland habitat that has the potential to support *Carex interior*.

Visual Quality

Introduction

Many factors affect the character of the landscape. Landscape attributes such as landform, vegetative pattern and species makeup, water characteristics, and architectural elements, all contribute to the aesthetic character in this area. Desired landscape character, as used in this report, is the combination of attributes that contribute to a positive sustainable experience. This report addresses social, physical and biological elements of the ecosystem we are operating within. The desires of the people who value this area determine what is desired and the conditions defined by the historical range of variability indicate what is sustainable, or desirable.

The terms scenic stability and scenic integrity are used as general ratings of the existing landscape character. Scenic stability refers to the ability of a landscape to sustain desirable characteristics over time, how healthy is the system. As one looks at scenic stability, it would not be unrealistic to be looking out 50 years or more in the future. Scenic integrity is a measure of the degree to which a landscape, an existing structure or management activity, or proposal deviates from the desired landscape character. It can be used to reference a proposed action, an existing situation, or a desired condition. It is much more dramatic, immediate, and understood, many times reflecting changes being introduced by timber harvest or road construction. The framework for both ratings is the public lands within the planning area, as seen from within the planning area or from afar, according to land management standards. Scenic integrity in this case is driven by viewpoints within or immediately adjacent to the planning area, primarily along Highway 26.

Regulatory Framework

A portion of the Dads Creek Planning area is identified as Management Area 21, Visual Corridor. The goals for the sensitivity level 1 corridor identified along U.S. Highway 26, as stated in the Land and Resource Management Plan, Malheur National Forest, 1990, are to "manage corridor view sheds with primary consideration given to their scenic quality and the growth of large diameter trees. Visual quality objectives of retention, partial retention, and modification will be applied while providing for other uses and resources." Forest standards for foreground retention limit the size of created openings to 2 acres, stress the use of uneven aged management, and limit the percentage of foreground area that can be in a created opening at any one time to 10%. The intent is to create stands composed of large over story ponderosa pine in an open park like setting which features the large trees as well as healthy under story trees.

The Landscape Aesthetics Handbook requires an analysis that considers more than effects that impact natural appearing landscapes. We are directed "to prescribe management which promotes sustainability" (Agriculture Handbook number 701, Landscape Aesthetic, A Handbook for Scenery Management, 1995, pg. 23.) We are directed to use an interdisciplinary process that integrates the physical, biological and cultural/social information available to us relative to the ground we manage. It is not only the existing landscape against which we base comparisons, but what is ecologically sustainable and desirable.

Analysis Methods

This report addresses the effects to Visual Quality and Landscape Aesthetics of the Dads Creek Wildland Interface proposals. Effects to Visual Quality are measured in terms of whether alternatives, or elements of a proposal, meet the visual quality level outlined in the Forest Plan. Effects to landscape aesthetics are measured in terms of positive or negative impacts to scenic stability and scenic integrity. Scenic integrity is a measure of the intactness of the landscape, to what level has a proposal deviated from a natural appearance. Impacts that introduce negative elements to the landscape reduce the scenic integrity. In general, activities that reduce the sustainability of natural forest eco-systems decrease scenic stability. Impacts that improve or support sustainability of the forest eco-system increase forest stability. Determinations of what visual quality level(a measure of scenic integrity) have been accomplished or introduced was determined in conjunction with individuals including an interdisciplinary team, a forest landscape architect, the public and Forest staff personnel. Plan standards were used for comparison to field results.

Existing Condition

Existing Scenic Integrity

Currently this area shows a low level of disruption that is subordinate to the natural landscape. Partial cutting has taken place, and natural regeneration of early and late seral species has been prolific. Clear cut units have been placed on unbroken landscapes in the middle ground and back ground areas, but are outside the viewed area. A limited amount of harvesting through commercial thinning and partial cutting has occurred in zones visible as travel corridors. All are currently fully re-stocked, meeting current stocking level guidelines. The scenic integrity has suffered as a result of past emphasis on fire suppression. With high fuel loadings and high stocking levels scenic integrity, as well as stability, has been in decline. We still have high quality options in meeting visual quality objectives in foreground and middle ground views in the long term, due to natural levels and arrangement of stand diversity. Foreground and middle ground views from Highway 26 carrying visual quality objectives of retention, partial retention and modification offer good opportunities to meet visual quality objectives and address forest health concerns, once the issues surrounding over stocked stands, high fuel loadings, and poor species composition have been dealt with. There is a low to fair amount of natural and induced variety

Existing Scenic Stability

Existing scenic stability is an indication of the sustainability of a landscape. A landscape with a low rating would likely be difficult to manage, or maintain over time. The existing scenic stability is determined by considering the current condition of key resources and the current trends that exist.

Currently, there are numerous trends in this planning area that indicate that the scenic stability is in poor condition, or would be rated low. The coniferous forest is generally overstocked, in both ponderosa pine types as well as mixed fir types, with excess ground fuels and ladder fuels. Natural processes associated with fire exclusion are obvious. These conditions will make it difficult to keep wildfire starts from expanding rapidly and burning intensely. The suppression of fires has resulted in a change in species and structural stage composition. These developmental trends are critical to the scenic stability of this landscape because these trends and the condition of the forest affect so many other resources. These trends are difficult to maintain.

The scenic stability of this area will be impacted in different ways, depending on what level of treatment is pursued in stands that are outside what one would expect to develop naturally. It is generally expected that as an alternative is developed that treats additional acreage in stands that have developed in response to fire exclusion and stand replacement, it will have some identifiable benefits.

The following chart indicates the need for silvicultural treatment as identified on a stand by stand basis. For a more in-depth discussion of the current area condition relative to more natural conditions, review the silvicultural prescription and analysis. These figures are highlighted here only to show what level of treatment would be required to return all of the stands to a condition which would more nearly reflect natural conditions.

Table VQ-1 Summary of Prescribed Treatments

Silvicultural Treatment	Stand Diagnosis Treatment Needs	Proposed Action Acres
Conversion to Early Seral Species	1458	28
Commercial Thinning	1383	755
Pre-commercial with Commercial Thin	1158	666
Under story Removal	653	362
No Treatment	1199	4289
Riparian	453	453
Precommercial Thinning	943	799

It is not realistic to expect to move the planning area balance of stand types to what would be desirable in a short period of time. It may never be accomplished. However it is desirable to move in that direction. From a visual standpoint, it is desirable to work within ecological frameworks and meet established visual quality objectives, or work towards that end in the long term. It is desirable to work in conjunction with other resource areas and identify sustainable situations, as well as conditions that lead to a mutually beneficial treatment or even a maintenance of the existing situation.

Desired Condition

Desired Landscape Character

In this area the landscape character is largely composed of natural elements, however there are historic elements such as those discussed previously, and facilities associated with developed sites and transportation systems. By considering the comments and concerns of the public the bio/physical conditions required for sustainability through time, and direction established in the Forest Plan the desired landscape character is determined.

It is desirable to have a forest environment that is healthy, sustainable, and that supports the uses of today's constituents. Some recreationists enjoy the open park like character of the large ponderosa pine and larch stands that can be sustained by low intensity frequent burnings. Many enjoy the diversity and escapement cover for wildlife offered by dense, over stocked patches. Also, many enjoy the contrasts in types brought on by induced and natural disruptions within most landscapes. The historic features of this area are enjoyed by many. Dispersed camping along the many roads in this area is a valued experience. Access to the Dixie Mt. area in a pleasing environment is valued. Hunting is the dominant human activity in this area at this time, therefore a mix of habitat types that provide food, escapement cover, and seclusion for big game would be desirable. An environment that can support these activities and meet these expectations is the desired landscape.

A sustainable environment that provides a mosaic of open park like stands mixed with pockets of more densely spaced trees to provide cover for game animals, healthy riparian areas and infrastructure for dispersed camping and vehicular access, coupled with pleasing visual attributes, is the desired landscape character.

Recommendations

Efforts should be made to move the existing conditions toward the desired landscape character, conditions that are sustainable. An improvement in the sustainability of this area will not be accomplished by not treating the stands in this area, providing for more transition to later seral stages. Efforts need to be made to move conditions towards a balance that can be sustained. Forest stand health needs to be improved. Efforts to restore a more fire resistant forest should be considered a high priority for the future of the areas scenic and ecological stability

The scenic integrity is dependent on the care taken in designing projects to minimize impacts that detract from natural appearing landscapes. If project implementation creates long lasting (10+ years) impacts of large magnitude that totally detract from a naturally appearing landscape, scenic integrity will be severely degraded. However, to preserve scenic integrity entirely (no action) would be to maintain the low scenic stability and to encourage the persistence of the existing risk of large stand replacement fire and/or epidemics of insect and disease. In the event that the lack of ecological stability in the area drives alternative selection in this area, silvicultural prescriptions should reflect a desire to lessen the impacts to the visual experience and retain as much diversity in the way of large healthy trees as is consistent with forest health objectives.

Environmental Consequences

No Action Alternative

Direct and Indirect Effects

Visual Quality

The direct effects of no action to the Visual Quality of the area are minimal. The visual quality objectives would be maintained. The existing landscape character would not be directly altered.

Scenic Stability

The effects to Scenic Stability are considerable. The perpetuation of existing trends would negatively impact scenic stability. There are about 5600 acres of stands that have been identified in the area that are in need of silvicultural treatment to return characteristics representative of what would occur here naturally, or on a sustainable basis. These stands dominate the landscape both in the visual corridors and other management allocations in the area. Many of the stands are currently overstocked and fuel loadings are high. As long as these conditions exist over significant portions of the area, the potential for epidemics of insects or disease, or large stand replacement fire is high and continues to increase because the forest landscape has lost its characteristics of sustainability. In the event of an uncharacteristic fire, fueled by a build up of dead material and over stocked stands many of the desirable elements of landscape character would be lost for an extended period of time. If nothing is done to deal with forest characteristics associated with over stocking and high fuel loading, large, intense wildfires will occur more frequently.

Scenic Integrity

The condition of overstocked stands reduces the visual interest by reducing sight distances, restricting light from reaching the forest floor, prompting trees to grow shorter crowns and reducing the variety of color, line and form. These are direct effects to scenic integrity. They are of long duration to develop. The desired landscape character of open park-like stands of pine and larch is being diminished, therefore reducing the scenic integrity of the area. A no action alternative will perpetuate this trend. Many of the natural elements of the landscape system are currently being reduced, and show little promise of retuning naturally. The indirect effect to scenic integrity would be greater due to the existing trends that would not be addressed. The scenic integrity would be low to very low in 25+ years. An opportunity to introduce visual variety to a somewhat mundane landscape in places would be foregone by not pursuing treatment of stands at this time.

Cumulative Effects

The most impressive need in this area is to re-establish a healthy forest climate. Every growing season that passes without change being introduced to stocking levels and high fuel loadings, results in more dead trees, more shade tolerant species becoming established, and more fuel accumulating. By initiating treatment sequences at this time, including fuels treatments, and not delaying them, we can reduce the impacts of future insect epidemics, and/or fire.

A progression towards open, park like stands with pockets of a good balance of age classes will not occur under the No Action proposal. Visual integrity and stability will suffer, and ultimately conditions will culminate in a large uncharacteristic stand replacement fire. Risks to personal dwellings in the area will increase, and fire resistance to control and rate of spread risks will increase.

Proposed Action Alternative

Direct and Indirect Effects

Commercial Thinning and Understory Removal

Scenic Integrity
Commercial thinning creates minimal negative impacts to scenic integrity. This practice could improve the landscape character by opening up the foreground views and allowing more light to the forest floor, which would create a more pleasing visual appearance. The effects would include improved health by reducing competition for those fire resilient tree species that are left, a shifting in size classes as openings are invaded by pioneer species, and improved growth rates in trees left on the site.

Commercial thinning at variable densities can successfully introduce variation and desirable change into even the most closely scrutinized foreground views. Changes in form, structure and color can result from commercial thinning.

Scenic Sustainability
Commercial thinning would reduce stand densities, and produce more favorable conditions for the ponderosa pine and western larch species. Effects would include lowered risk of stand replacement fire and/or epidemics of insects and disease.

Conversion to Early Seral Species

Scenic Integrity
Effects to scenic integrity could be favorable in that the openings created could provide a spatial mosaic of natural appearing patches of varying sizes giving variety to the forested landscape. These openings would not appear as clearcut units on the landscape, and irregular spacing of leave trees could help to soften impacts and blend into adjacent unharvested stands. Negative effects would occur during the implementation of the harvest, and would lessen over time as regeneration and occupation by grasses and forbs occurs.

The risk of large stand replacement fire and/or insect and disease epidemics, would be reduced by creating breaks in the forest vegetation, reducing stocking, improving the health of residual trees, as well as creating changes is stand structure. Openings would be favorable to fire resilient early seral species such as ponderosa pine and larch, which provide the large tree open park like character and are fire resistant.

Scenic Stability

The reduction of competing species to those fire resilient species that make the forest landscape more sustainable would be started. The openings created would allow ponderosa pine and larch to establish, or be established, where fir species were harvested. This would help reduce the risk of stand replacement fire and/or insect or disease epidemics.

Road Construction

Road construction can have a major impact on visual quality. The proposed action does not call for the construction of any new roads that will detract from the visual experience in the travel corridor. The 1.8 miles of temporary roads are outside of areas which would detract from expected visual experiences.

Harvesting Procedures

Associated with silvicultural treatments are the elements of logging practices that can negatively impact scenic integrity. Harvesting in the foreground and middle ground views has been done with mixed success across the Forest. Some did not meet visual quality objectives. Much, however, has healed over time, and increased growth rates and natural regeneration in shade tolerant species has improved scenery conditions.

Tractor and Skyline Skidding

Tractor skidding will directly impact foreground views. These effects consist of soil, duff and vegetation ground cover disturbance. The impact is not wide spread but can be evident for 1 to 5 years after harvest. Skyline skidding will impact views. Negative effects consist of radial striations from a high point in the landscape where corridors are used to pull trees up slope. Tractor skidding can be evident in some foreground views for 1 to 5 years. Skyline skidding can be evident in middle and background views from 5 to 10 years.

Prescribed fire and associated activities

Prescribed fire often creates a natural mosaic pattern of tree scorch and crown fires. However, there are events that create pockets of torched trees that can impact foreground views if they occur along roads or trails. Hand line and machine line placed to control prescribed fire are very necessary but can create a line of disturbed soil and vegetation that detracts from the natural setting. Hand lines can be evident for 1 to 5 years but these results are often not necessary.

Fuel treatments along Highway 26 are expected to consist of hand piling and burning, which will be of short duration impact. Treatment of piles, as well as skid trails and landings will eliminate undesirable long term visual impacts.

Visual Quality Objectives

The current visual quality objectives would be met by harvesting in the proposed action in foreground and middle ground units along 26. The Proposed Action includes design criteria to eliminate undesirable visual impacts.

Cumulative Effects

The most impressive need in this area is to re-establish a healthy forest climate. Every growing season that passes without change being introduced to stocking levels and high fuel loadings, results in more dead trees, more shade tolerant species becoming established, and more fuel accumulating. By initiating treatment sequences at this time, and not delaying them, we can reduce the impacts of future insect epidemics, and/or fire.

There are about 5600 acres of stands that have been identified in the area that are in need of silvicultural treatment to return to conditions representative of what would occur here naturally, or on a sustainable basis. These stands dominate the landscape both in the visual corridors and other management allocations in the area. A progression towards open park like stands with pockets of a good balance of age classes will not occur under the no action proposal. Visual integrity and stability will suffer, and ultimately conditions will culminate in a large uncharacteristic stand replacement fire. Risks to personal dwellings in the area will increase, and fire resistance to control and rate of spread risks will increase.

Harvesting at the levels established by the interdisciplinary team, as well in the pattern established will meet the established purpose and need. It will afford protection to dwellings in the area, work within parameters established by other resource areas, as well as involved publics, and provide a measure of safety for firefighters that subsequently fight fire in this area. Silvicultural prescriptions are responsive to opportunities to retain healthy trees to lessen visual impacts.

Consistency with Direction and Regulations

The project is consistent with the Malheur National Forest Plan, as amended.

Irreversible and Irretrievable Commitments

The project as described will not result in any irreversible or irretrievable effects to the scenery resource. This project is consistent with guidelines for scenery set forth in the Forest Plan as well as the handbook for scenery management titled Forest Aesthetics.

Recreation

Introduction

This specialist report contains an analysis of existing recreation conditions in the Dads Creek Wildland Urban Interface (WUI) Project area and an analysis of effects from proposed activities on recreation facilities.

Regulatory Framework

Guidelines from the Malheur National Forest Land and Resource Management Plan 1990 are used to determine the condition of facilities and dispersed campsites. More details regarding the regulatory framework for recreation are located within the Specialist Report.

Recreation Opportunity Spectrum

The project area falls within the Roaded Natural class of the Recreation Opportunity Spectrum (ROS). Roaded natural is characterized by predominately natural appearing environment with moderate evidence of sights and sounds of man. Resource modifications and utilization practices are evident by harmonize with the natural environment. Interaction between users may be moderate to high, with evidence of other users prevalent. Motorized use is allowed.

Existing Condition

Developed Sites

There are no developed campgrounds, trails, or trailheads within the project area.

The Sumpter Valley Railroad Interpretative Site is located on Highway 26. It offers travelers a chance to stop for a few moments, enjoy the scenery, and learn about the historic railroad operations and it's role in providing early transportation to the John Day Valley. There is a proposal to move the parking area to a safer location and expand its capacity.

Snowmobile Trails

A snowmobile trail is shown in GIS that follows the 2600087, 2600306, and 2600318 roads within the project area. It is not usually groomed. Use of these roads during the winter recreational season, is generally December 15th through April 15th (though timing varies with snow conditions).

Dispersed Sites

The analysis area receives low to moderate recreation use, which is spread throughout a six month period starting in late May and running through mid-November. There are several established dispersed campsites within the project area. Dispersed campsites offer the recreationist a more primitive camping experience. Fall hunting season use is moderate to high with use distributed throughout archery, deer and elk seasons. Hunter use of the dispersed sited varies depending on number of hunting tags for a unit and the number of “new” hunters in the area.

Off Highway Vehicle Use (OHV)

A portion of the project area is designated as Big Game Winter Range. To protect big game, OHV use is prohibited on all roads between December 1 and April 1, except for designated routes that are compatible with management area emphasis.

Environmental Consequences

Alternative 1 – No Action

Direct and Indirect Effects

Under the no action Alternative there would be no impacts on recreationists and forest recreation settings from restoration activities, and there would be no timber hauling from National Forest lands to conflict with recreational traffic. There would be no change in road miles available for public travel.

Impacts associated with no action are a continued high number of acres at risk from severe disturbances from fire, insect or disease, which may reduce the amount of area suitable for recreation activities, and recreation facilities could be negatively impacted. Hazard trees would still be removed on an annual basis along public roads. No road segments would be closed and there would be no additional non-motorized trail opportunities. There would be no impacts to these areas from timber harvest and post-harvest activities. Scenic quality would continue to decline due to the high stand densities (see Visual Quality section in this Chapter).

Alternative 2 – Proposed Action

Direct and Indirect Effects

Effects to recreation are measured in terms of change in the recreation opportunity spectrum (ROS). There would be no effect on the ROS class for this area. There will be little change from the existing condition.

Tree harvest and fuel reduction activities may displace recreationists in the short-term, particularly those who cannot tolerate changes to their traditional recreation setting, therefore would result in some level of changes to the recreation setting. Displacement may be due to physically closing access to areas during vegetation management activities and, indirectly by altering the setting. Harvest and post-harvest activities would have the longest duration effect on use by recreationists, while prescribed burning would only physically prevent recreationists from visiting areas during implementation of the activity. In addition, hauling timber along forest roads may also affect visitors by increasing the perceived hazard of traveling along narrow forest roads with log trucks. Tree harvest and fuel reduction activities that occur during seasons other than summer and fall would impact fewer recreationists.

Removal of hazard trees along haul routes and recreation sites would have a positive effect on both the actual and perceived safety of recreation sites and travel routes.

Changes in road access can change the ability of visitors to access recreation sites. Reopening roads for harvesting, thinning, and fuel treatments open up new areas to vehicle traffic and can temporarily establish areas of new recreation use. These roads are planned for closing after activities are completed so use will again be restricted in the long term. Closing roads (either temporary or long-term) to vehicle use restricts vehicle access, but can result in additional non-motorized trail opportunities (walking, biking and horseback riding).

An indirect effect from opening dense stands in this project area is the increased ability for people to drive vehicles through the open forest, so there may be an increased risk of off road vehicle use if the forest is easier to drive through.

The recreational experiences available may be changed in the short term by logging activities. The possible effects include increased sights and sounds of equipment and people within the planning area during harvest activities for a short period of time. The recreational experiences may also be changed in the short term by the smoke caused by pile burning at the landings. The possible effects include smoke affecting someone who has trouble breathing and their visibility may be obscured for a short period of time.

Large-scale disturbances from wildfire, insect or disease, can result in broad changes in recreation settings, particularly by altering the aesthetic quality of settings, the quality of riparian habitat that supports fishing, and by reducing the thermal cover from high summer temperatures and exposure. Recreationists would also not be able to visit forest areas during wildfire suppression activities. The reduced fire risk would allow more use of the forest in the future.

Since the negative impacts on scenic quality are expected to be short-term (see the Visual Resources section) and are expected to enhance the scenic quality over the long term, it is not expected that recreationists would be displace due to a change in the forest setting. In fact, since driving for pleasure and sightseeing is an important activity in the project area, it is expected that the proposed action would improve the quality of this activity.

This action would maintain most of the existing road miles and resulting in only minor changes in the opportunity for the public to drive on forest roads within the project area.

Proposed activity may affect the quality of hunting and fishing in the project area. Changes to the riparian areas are not expected to be very noticeable to recreationists, so setting for fishing may not change in the short-term. Big game hunting is another popular recreation activity in the area, with displacement of deer and elk in the short term a possibility.

Snowmobile activity in this area is a mix of travel on un-groomed designated trails and on other area roads. Winter logging /biomass haul could cause displacement of snowmobiles to other areas nearby. Proposed road closures or decommissioning will not affect existing designated snowmobile trails in the Dads Creek WUI Project Area.

Actions under this project are expected to contribute to the increased perceived and actual safety of recreationists from wildfire on the Malheur National Forest.

Cumulative Effects

Reasonably foreseeable future activities in the analysis area with a potential to affect recreationists include road closures. Proposed road closures will reduce areas that the visiting public will be able to drive, disperse camp and view scenery. Other foreseeable future activities include commercial and precommercial thinning and fuel treatment along Highway 26 east of Dixie Summit. Once stands are treated to reduce the current fuel loads they will be in suitable condition to begin reintroducing fire into blocks of land within the project area.

Consistency with Direction and Regulations

This proposed project is consistent with Forest Plan direction and regulations. The proposed project will meet Forest Plan Standards for the Recreation (ROS) of roaded natural and roaded modified. Proposed activities are consistent with Forest Plan direction to manage General Forest and Rangeland (MA 1 & 2) to maintain dispersed camping opportunities in a roaded setting and manage these areas for partial retention as roaded natural, and to provide roaded recreation opportunities.

Recreation in MA 3A (Non-Anadromous Riparian) is managed as roaded natural but standards include limiting and distributing recreation use as necessary to protect and/or rehabilitate riparian areas.

Irreversible and Irretrievable Commitments

There are no irreversible and irretrievable commitments associated with the consequences of any of the alternatives analyzed to the recreation resource.

Roads

Introduction

The project area can be accessed from the north-east and south-west by US 26. The other main access roads in the project area are the 2600306, 2600374, and the 2600350 roads, which are Maintenance Level 2 and 3 roads, with aggregate surfaces. The road surfaces for the 2610 road (Maintenance Level 3) and Maintenance Level 1 or 2 roads in the project area are typically either improved or native materials.

The road system has evolved over time. Original access into the north-west portion of the project area was by railroad during the 1910s and 20s. The Forest Service was building roads for fire access starting in about 1925, and much of the area had some access by 1950. The majority of the forest roads in the south-east portion of the project area were constructed between 1970 and 1995 to support timber-related land management objectives.

Regulatory Framework

Roads Analysis

A Forest Level Roads Analysis (FLRA) for the Malheur National Forest was completed in December 2004, which addressed the “potential minimum primary transportation system” throughout the Forest, including many of the primary access roads in the project area. The Dads Creek WUI Roads Analysis was tiered to the FLRA, addressing the local roads in the project area, and intended to inform road related decisions at the local Watershed and Project scale.

An interdisciplinary process involving members Ranger District staffs representing various resource areas was used to complete the roads analysis for the Dads Creek WUI project. The team was charged with analyzing all of the roads in the area and recommending whether to maintain or change their current status (open or closed), and which roads are no longer needed and should be decommissioned.

Forest Plan

The Forest Plan established open road density goals to not exceed 2.2 miles per square mile for winter range, and not exceed 3.2 miles per square mile for summer range. The Forest Plan also provided long term goals, stating that access management planning will strive for open road densities not exceeding 1.5 mi/sq mi. on summer range and 1.0 mi/sq mi. on winter range unless those densities do not allow for a healthy and productive forest as envisioned in the desired future condition, or interferes with access to private land.

Analysis Methods

Road Condition Surveys (RCS) were completed for all roads in the project area during the fall of 2007. The surveys included completing a road log during the field inspection of each road. The RCS road log forms included data on whether the road is currently open or closed, the surface type, erosion concerns, maintenance needs and whether the road should be recommended for decommissioning. Each road in the project was field checked and road logs updated to reflect existing conditions. This information was used to upgrade the GIS data base (INFRA Travel Routes).

Assumptions

The Dads Creek WUI Roads Analysis was done using the following assumptions:

- The need for a basic transportation system will continue to exist.
- Available maintenance dollars are likely to remain static or increase only marginally in the foreseeable future.
- Roads can adversely affect water quality and riparian habitat.
- Poor road conditions can present a hazard to users, and are a liability to the Forest.
- Roads will continue to be used for recreation, administration, fire protection, permit and contract access, special uses, mining, and other traditional uses.

Road Analysis Recommendations

- The roads analysis recommended closing 1.4 miles of road that are currently open:
- Road 2600369 – Install gate to close road (.7 miles) to prevent additional impacts until it can be analyzed further.
- Road 2600388 – Close last .7 miles of the road to bring winter range road densities within Forest plan standards.

Existing Condition

Within the project area boundaries there are a total of 62.56 miles of National Forest System roads, including 29.70 open road miles and 32.86 closed road miles. Maintenance Level 3 roads receive relatively frequent maintenance with the annual Road Maintenance Plan, while Maintenance Level 2 and 1 roads receive only very minimal maintenance except when maintenance is performed in association with specific projects such as timber sales. In recent years most of the available funding has been directed towards maintaining the Forest Arterial and Collector roads (Level 3 to 5), which will receive the highest traffic use. The maintenance needs of local roads (Level 1 and 2 roads) are typically deferred, because the funds to maintain the roads to standard are simply unavailable.

Most of the roads in the Dads Creek project area will need some maintenance done to meet current road maintenance objectives and classification standards.

The road condition surveys revealed a significant number of discrepancies between actual on-the-ground conditions, and the conditions that were recorded and stored the Forest INFRA database. The following changes were made in the INFRA database to reflect the actual current conditions on the ground:

- The following roads were found to be closed on the ground by management devices such as earth berms, pole barricades, or other devices. Their status was changed in INFRA from Maintenance Level 2 (open) to Maintenance Level 1 (closed).

  Roads: 2600455, 2600438, 2600808

The following table was prepared after all the changes described previously were completed in the INFRA database.

Table R-1. Current Road Densities and Total Road Miles by Subwatershed:

SUBWATERSHED	Total Miles	Total Area (Sq. Miles)	Total Road Density (Mi/Sq. Mi)	Open Miles	Closed Miles	Open Road Density (Mi/Sq. Mi)
Dads Creek						
Winter Range	7.09	2.7	2.6	6.4	.69	2.4
Summer Range	55.47	8.1	6.8	23.3	32.17	2.9
Total	62.56	11.1	5.6	29.7	32.86	2.7

Note: Rounding road miles during calculations may result in minor (0.1) mile discrepancies.

The numbers and mileages listed in Table R-1 are compiled using all Forest Service System Roads, Private, and County Roads, in the USFS GIS data. The mileages are based upon USFS GIS lengths for each road segment. All values are calculated based upon total acreages in each sub-watershed, including wilderness areas.

Environmental Consequences

Alternative 1 – No Action

Direct and Indirect Effects

Table R1 indicates that minimum standards for open road densities are being met on a sub-watershed basis with the exception of winter range (2.4 miles per square mile). Under the No Action alternative, all existing open roads would be left in the same condition they are in now. Winter range road density would remain over Forest Plan standards and sediment would continue to move into Dads Creek from the 2600369 road. Motorized access would continue to be provided at existing levels, with no foreseeable funding opportunities to improve overall road conditions, including road surface and drainage maintenance and improvements. The roads would continue to deteriorate over time until and unless other funding opportunities become available.

Alternative 2 – Proposed Action

This alternative would not build any new permanent roads. 1.8 miles of temporary roads are to be built to access skyline and tractor landings and are to be rehabilitated after use. 29.7 miles of currently closed roads will be opened for timber harvest and then would be reclosed. 1.4 miles of currently open roads are to be closed to reduce impacts to resources, the 2600388 road to reduce winter range road density and the 2600369 to reduce sediment input to Dads Creek. Water for dust abatement may be drawn from Clear Creek just north of the Blue Mtn. Work Center (T11S, R35/1/2E, Sec34). This is a constructed water source with a crushed rock pad.

With this alternative, there would be road maintenance on up to 44 miles of forest roads commensurate with commercial uses. Because the maintenance be commensurate with use, the amount actually accomplished will vary depending on existing road conditions, season of use and other factors. The type of road maintenance activities which may occur on roads used for commercial haul could include:

- Blading and shaping of road surface and ditches
- Removing excess materials from roadway
- Construction or reshaping of drain dips, grade sags, waterbars, or cross ditches
- Spot rocking of road surface
- Felling and or removal of danger trees and brush removal from roadway
- Minor realigning of road junctions
- Cleaning culverts
- Seeding

Direct/Indirect Effects

With this alternative most roads in the planning area would temporarily experience increased levels of traffic and use associated with Dads Creek WUI project activities. Some currently closed roads will be temporarily opened for use and closed again as activities are completed. Approximately 1.8 miles of temporary roads will be constructed and effectively decommissioned after activities are completed. The temporary roads would result in a short term loss of productivity, but those areas would be returned to productivity when the roads are rehabilitated.

Winter range road density would be under Forest Plan standards and sediment transport into Dads Creek from the 2600369 road would be reduced.

Because of the maintenance work that is planned, overall road conditions should have at least a slight upward trend during the project activities and for at least five years afterwards and a reduction in road related sediment delivery to local streams.

Cumulative Effects

Considering the past, ongoing, and planned future activities in the area, and the fact that the action alternative would not result in only minor changes to motorized access once the project activities are complete, any cumulative effects changes related to the road system are expected to be negligible.

Consistency with Direction and Regulations

Alternative 1 – No Action would not meet the Standards and Guidelines contained in the Forest plan. Alternative 2 - Proposed Action is consistent with Forest Plan direction and regulations, with a slight reduction in winter range open road density.

Irreversible and Irretrievable Commitments

Some roads may require rock on roads for spot rocking in wet areas. This would be an irreversible commitment of the rock resource for road improvements. This material would come from the Dixie Summit Pit on the 2600566 road.

There would be a short-term loss of productivity on the ground where 1.8 miles of temporary roads would be built, but those areas would be returned to productivity when the roads are rehabilitated.

Economics

Introduction

Although individuals and communities over a wide geographic area use national forest resources, the residents and businesses of counties near the forest depend most heavily on the availability of the resources. Consequently, the effects of forest management on social and economic factors are strongest within these areas. For this reason, the Malheur National Forest primary zone of influence is defined as Grant and Harney counties in Oregon.

Analysis Methods

The social and economic effects of the proposed management alternative were assessed in terms of viability of harvestable timber, employment supported and income provided. The following sections describe each of these criteria in detail.

Viability of Harvest

Although the Dads project has both a commercial and non-commercial component, harvest viability is only relevant to the commercial component. Therefore, viability of harvest was only analyzed for those units that had a commercial component.

The computer program, TEA_ECON , was used to estimate the sale revenues based upon the estimated tentative advertised bid rates per hundred cubic feet ($/ccf) for the commercial acres of the action alternative. These bid rates indicated the economic viability of harvesting timber. The estimates of these bid rates were based on the most current estimates of the following:

- Estimated volume per acre — estimated from local knowledge of stands. All volume is in hundreds of cubic feet (ccf). An average commercial unit volume was estimated at 4 ccf per acre.
- Species Composition — estimated at 90 percent ponderosa pine, and 10 percent Douglas-fir and other species for the sale as a whole.
- Estimated Volumes of Sawtimber are shown in Table E-1.

TEA_ECON: An economic analysis tool that allows the user to perform timber sale accounting at the planning or sale layout level. The program uses price and cost data and the quarterly updated regional record of timber sale transactions to generate gross timber values, estimated advertised rates, and cash flow estimates.

Table E-1. Commercial Acreage and Volume Estimates.

	No Action	Proposed Action
Commercial Unit Area (Acres)	0	1811
Ponderosa Pine Sawtimber (ccf)	0	6603
Other Sawtimber (ccf)	0	733
Total Sawtimber (ccf)	0	7336

Preliminary Value of Timber Removed — based on a weighted average for all sales actually sold within Appraisal Zone 3 (primarily Blue Mountain forests) within the last 12 months.

Costs — logging systems, log haul, road maintenance, contractual, brush disposal, erosion control, and other development. These costs are shown in Table E-2 and were discounted to present net values at a rate of 4 percent.

• Table E-2. Assumed Costs of Commercial Sale

Cost Center	Cost ($/ccf)	Year
Sale Preparation	16	0
Sale Administration	10	1-2
Stump to Truck	120	2
Log Haul	35	2
Road Maintenance	3	2
Brush Disposal and Erosion Control	3	2

An initial tentative advertised sawtimber bid rate ($/ccf) was determined by subtracting the costs associated with logging from the base period prices adjusted for the quality of the material and current market conditions. This rate was reduced by 10 percent per current appraisal methods (Transaction Evidence Appraisal) to account for competition between bidders. It is important to note that advertised bid rates have fluctuated over the last few years reflecting the volatility of the timber market. Prices would likely change in the future (e.g. when the actual sale appraisal occurs), depending on market conditions at that time. Therefore, these estimates should only be considered rough approximations of future conditions. As a result, calculated bid rates were rounded to the nearest dollar. Timber sale revenues were also discounted to present values at a rate of 4 percent.

Base Period Price: The volume-weighted average bid price of competitively sold timber sales in the previous 4 quarters. This value is updated quarterly.

Employment and Income

Employment and income effects from the commercial units were derived from multipliers obtained from the IMPLAN (Impact Analysis for Planning) model, and from the forest-level Timber Sale Program Information Reporting System (TSPIRS) analysis in fiscal years 1996 to 1998 (USDA 1998, USDA 2000). Analysis of employment (jobs) and income assumed that all harvesting would occur over the next one to two years. Two years was used for this analysis. Employment coefficients were 0.0029 direct jobs per ccf and 0.0018 indirect jobs per ccf. The direct income coefficient was $83.84 per ccf and the indirect and induced income coefficient was $54.12 per ccf.

Job estimates were based on the assumption of a direct relationship between changes in harvest volumes and manufactured output. In other words, a percentage change in harvest volume would result in an equal percentage change in manufactured output and employment. The model assumed that the price of timber is constant in response to changes in the supply of timber; the mills would not adjust their use of the factors of production (labor and equipment) to increase efficiency as a response to changes in the price or supply of timber; and the mills would not change their output per timber input in response to changes in timber supplies or changes to their mix of labor and equipment. Job estimates included temporary, permanent full-time, and part-time employment. Employment effects from recreation and domestic-livestock grazing activities were not analyzed because only minor or no changes were expected in the level of use for these activities. The estimates provided by this analysis also did not include unpaid family workers or sole proprietors. Estimates apply to communities and counties in the regional impact zone and not necessarily to any one county.

Levels of harvest volume by alternative would affect employment and income in several ways:

- Directly - (employment associated with harvesting, logging, mills and processing plants for sawtimber, pulp, chips, veneer and plywood)
- Indirectly - (industries that supply materials, equipment, and services to these businesses)
- Induced - (personal spending by the business owners, employees, and related industries)

Several factors would influence the ability of any one county or community to experience the largest extent of the harvest-related employment and income effects. The financial viability of the timber sale proposals would influence whether potential purchasers closest to the project area could compete with other purchasers to acquire the majority of the supply. Changes to bid rates would likely occur during appraisal, depending on actual market conditions at that time. Employment projections would depend on other factors such as market conditions, quality and quantity of the volume offered for sale, timing of the offerings, and financial conditions of local firms.

There are no IMPLAN employment multipliers for non-commercial thinning projects, so direct and indirect employment from the thinning of the non-commercial units could not be estimated. However, the cost paid for this work was assumed to go directly into the local economy as direct income. Indirect income was estimated as being in the same proportion to direct income as in a commercial timber sale.

Environmental Justice

The population of the area is predominately white, followed by American Indians. The region is sparsely populated, and contains low populations of minorities (3.4% of the Grant County population, 3.7% of Baker County, 7.6% of Harney County (United States Census Bureau 2007). The primary American Indian tribes involved are the Burns Paiute Tribe, Confederated Tribes of the Umatilla Reservation and Confederated Tribes of the Warm Springs. With the Exceptions of the Burns Paiute Tribe, minorities are scattered throughout the counties.

Data regarding minorities or people with disabilities employed in the region in the timber, mining, ranching, road construction, forestry services, and recreation sectors is unavailable. Some contracts are reserved for award to minority businesses under the USDA Office of Small and Disadvantaged Business Utilization and the Small Business Administration, although overall contract amounts to these groups has declined since 1998 (Kohrman 2003).

With implementation of the proposed action alternative, there would not be disproportionately high and adverse human health or environmental effects on minority or low-income populations. The actions would occur in a remote area and nearby communities would mainly be affected by economic impacts as related to contractors implementing harvest and thinning activities. Racial and cultural minority groups are often prevalent in the work forces that would implement prescribed fire, tree planting, herbicide application, or thinning activities. Contracts contain clauses that address worker safety.

Effects on civil rights, including those of minorities and women, would be minimal. Activities associated with the action alternative would be governed by Forest Service contracts, which are awarded to qualified purchasers regardless of race, color, sex, religion, etc. Such contracts also contain nondiscrimination requirements. While the activities identified here would create jobs and the timber harvest would 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.

Economic Efficiency

Economic efficiency is a term used to describe how well inputs are used to achieve outputs when all inputs (activities) and all outputs (including market and non-market) are identified and valued. All costs and all benefits to society are included; amounts of each output are not pre-established but are produced in amounts that maximize net public benefits" (FSH 1909.17, §11.1).

Due to unavailable information, the non-wood outputs from this project could not be valued. Therefore, the economic efficiency of this project was measured by cost effectiveness, as recommended by FSH 1909.17. Cost effectiveness analyses attempt to determine the least costly alternative to produce the desired result. The objective of the cost effectiveness analysis was to show a relative measure of difference between alternatives. Where harvest viability was analyzed for only the commercial units, cost effectiveness was analyzed for all units, together. The analysis focused on identifiable and quantifiable ecosystem benefits and costs for each alternative in terms of the present net value to assess which alternative came nearest to achieving the purpose and need over the largest land area at the least cost. All dollar values were discounted in terms of the present net value (2004 dollars). The real (exclusive of inflation) discount rate used was 4 percent.

The measurement of economic efficiency differs from the measurement of harvest viability in that economic efficiency attempts to put values on the full range of inputs and outputs (both market and non-market) associated with the project, while harvest viability is more an accounting procedure that only considers the costs and revenues of the project as expressed in timber markets.

Table E-3. Employment and income by alternative

	No Action	**Proposed Action**
Timber Volume (ccf)	0	7336
Employment		
Direct (Jobs)	0	21
Indirect (Jobs)	0	13
Total (Jobs)	0	34
Income		
Direct ($)	0	$615,050
Indirect & Induced ($)	0	$397,024
Total ($)	0	$1,012,074

Employment coefficients are 0.0029 direct jobs and 0.0018 indirect jobs per ccf.
The direct income coefficient is $83.84 and $54.12 indirect and induced income per ccf
Employment Coefficients for non-commercial thinning projects are unavailable.

In this project, cost effectiveness was measured in terms of present net value (PNV) per acre or:

PNV/acre = Present Net Costs/acre – Present Net Revenues/acre

Measurable costs and benefits on commercial units were based on costs and revenue from timber volume proposed for harvest and described under the assumptions for harvest viability.

Existing Condition

Viability of Harvest

The viability of harvest is dependent upon the market prices for raw wood fiber and the costs of harvest that are identified in the above Methodology and Assumptions section. Market prices are determined by the supply and demand relationships that exist for wood fiber on a global scale.

Local sawmills that could bid on the sawtimber from this project are located in La Grande, Pilot Rock, Prairie City, and John Day. In addition to local sawmills, three to four large logging contractors usually bid on local timber sales, and if successful, could sell the sawtimber to the same local sawmills.

Employment and Income

Agriculture, manufacturing (particularly wood products), and food processing are important sources of employment and income in this region. Reliance on timber and forage from federal lands is moderate to high in several counties in the impact zone (Haynes et al. 1997). Many communities in the impact zone are closely tied to the forest in both work activities and recreation. Cattle production and forest products provide the core employment for Grant and Harney counties. Forest products industries include 3 major lumber mills and numerous logging companies. Wood products employment totaled 410 direct jobs (ie mill workers and loggers) and 102 indirect jobs, approximately five % of the total non-farm employment in Grant and Harney counties (average annual in 2007). Local government, retail trade, and services employ the most people in Grant and Harney counties, (Oregon Employment Department 2007). The area surrounding the project area is rural, and has a disproportionately high unemployment compared with the Oregon state average and the National average.

Economic Efficiency

Volumes, costs, and revenues from the commercial units were analyzed for cost effectiveness. The derivation of the commercial unit data is described in the Harvest Viability section of this report.

Environmental Consequences

Alternative 1

Direct and Indirect Effects

Viability of Harvest

The No Action alternative would not harvest timber, so would not affect harvest viability.

Employment and Income

This alternative would not harvest timber and therefore, would not support direct, indirect, and induced employment, or increased income to local economies. Declining trends in timber harvesting from National Forest lands would continue in the future and contribute to declines in wood products employment over the next two decades. Changes in the economic base and wood products infrastructure for the impact area would also continue to be influenced by fluctuations in market prices, international market conditions, changes in technology, and industry restructuring.

Economic Efficiency

The public would incur no costs, nor realize any benefits of timber harvest in this area. No Action would yield a present net value of 0 due to the data limitations (described in the "Methodology and Assumptions" section) for quantifying economic benefits and costs beyond those identified at the project level. This value ignores the risks to forest health, vigor, and fire resistance that would increase without implementation of this project, and the resulting losses in timber values and non-market benefits. Data limitations do not allow for the quantification of this risk, however, this risk would negatively affect present net value. Ongoing costs associated with management of the area, including the continuation of economic losses in stand values from recurring forest health problems, would continue.

Alternative 2

Direct and Indirect Effects

Viability of Harvest

The TEA_ECON program was run for harvest viability. The results of each program run, and the effects of all alternatives on harvest viability, are shown in Table E-4.

Table E-4. Estimated Average Bid Prices and Net Present Value for Commercial Units ($/ccf)

	No Action	Proposed Action
Average Bid Price ($/ccf)*	0	33
Discounted Sale Revenues**	0	$219,569
Discounted Sale Costs	0	$209,245
Present Net Sale Value	0	$10,324

* The average bid price is rounded to the nearest dollar.
* Sale revenues and costs are rounded to the nearest $1,000.

As shown in Table 4 this alternative would produce revenue, estimated at $219,569. Its costs would also be $209,245. This would produce an estimated present net value of $10,324 for the commercial component. This indicates the proposed action would produce a viable harvest.

Employment and Income

In general, the primary effect on timber harvest-related employment would occur from commercial harvesting associated with the action alternative over the next two years. Financially viable sales would be necessary to provide opportunities for timber harvest-related employment. Based upon the harvest data and the IMPLAN multipliers provided, small increases in employment would be expected (Table 3).

Contracts for the noncommercial areas and activities will also provide jobs through contracting; this is not estimated in the employment estimates in Table E-3.

The distribution of economic impacts would depend on the location of the timber purchaser awarded the contracts at the time of the sale, the availability of equipment and skills in the impact area, and the location and availability of the wood processing facilities and related infrastructure. Processors outside of Northeast Oregon could also potentially bid on the sales and distribute the jobs and income effect to other counties in the Blue Mountains or outside of the area entirely.

As Table E-3 shows, the proposed action would generate $1,012,074 in direct, indirect, and induced local income.

Based upon the commercial volume harvested, the proposed action would support approximately 34 jobs over the 2-year period, both direct and indirect, and contribute approximately 2 percent toward the 2007 annual average of 410 jobs of timber-related employment.

Economic Efficiency

Market benefits that could occur as a result of the proposed activities include increases in forest productivity and value for the remaining trees by eliminating competitive stress and reducing the risk of growth-limiting insect attack.

Table E-5. Estimated Net Present Value

Proposed Action	
Total Project Area (Acres)	1811
Commercial Units	
Average Bid Price ($/ccf)	$33.32
Discounted Revenues	$219,569
Discounted Costs	$209,245
Present Net Value	$10,324
Present Net Value per Acre	$6

Externalized costs such as those resulting from damage to soils, losses in wildlife habitat, and mobilized sediment in local streams are not well defined or measurable at the project level in terms that provide comparison of assigned dollar values. Refer to other sections on environmental consequences in this EA for a discussion whether these external effects would occur. The other sections of this EA also discuss the non-economic benefits to human and environmental resources for a relative comparison between alternatives.

Table 5 shows the Proposed Action would have a present net value of $10,324 and would have a net value per acre $6.

This economic analysis assessed the proposed action in terms of harvest viability, local employment and income, and economic efficiency as measured by cost effectiveness. Table E-6 summarizes the results of the analysis.

Table E-6: Summary of Economic Measurement Criteria Estimates for All Alternatives

	No Action	Proposed Action
Area Treated (Acres)	0	1811
Commercial Volume (ccf)	0	7336
Commercial Bid Rates ($/ccf)	0	$33.32
Local Employment* (jobs)	0	34
Local Income	0	$1,012,074
Discounted Revenue	0	$219,569
Discounted Costs	0	$209,245
Present Net Value	0	$10,324
Present Net Value per Acre	0	$6

Cumulative Effects

Viability of Harvest

Estimates for tentative advertised sawtimber bid rates for the proposed action are within the range of rates experienced by the three Blue Mountain forests (Malheur, Umatilla, and Wallowa-Whitman) within the last two years (Musgrove, 2004). Because of the competitiveness of the market, and its global nature, the no action alternative or the proposed action alternative would not affect prices, costs, or harvest viability of other present or future timber sales in the economic impact zone. There are also residual effects from past timber sales within the subwatershed which would not have a detrimental effect on the viability of harvest of the proposed action alternative. These past actions are described in detail in Appendix C:

Employment and Income

The Malheur National Forest Land and Resource Management Plan established an allowable sale quantity (ASQ) for the forest of 38.4 million cubic feet or 211 million board feet (MMBF) average per year. An ASQ is an upper limit for the plan period, not proposals for sale offerings or an assigned target. Actual sale levels, depend on factors such as limitations of modeling, changes in law and regulations, changes in budgets, and site-specific conditions. The Regional Foresters Eastside Forest Plans Amendment 2 (1995) and PAC FISH and INFISH in 1995 are Forest Plan amendments that were developed in response to some of these changing factors. A combination of the factors listed above has resulted in a trend of overall decline in the Malheur National Forest's annual offering of timber volume since the 1990 Forest Plan went in to effect.

The selection of the no action alternative has the potential to continue the decline of timber-related employment in the rural communities of Grant and Harney Counties. Continued declining trends in timber harvesting from the National Forest System (NSF) lands would potentially continue to impact wood products employment and associated indirect employment. Cumulative loss in timber-related jobs could affect the remaining infrastructure and capacity of the local rural communities, and could disrupt the dependent local goods and services industries.

The proposed action alternative would provide some potential short-term economic relief by utilizing commercially thinned sawlogs. This material would potentially be used to support the three saw mills operating in the John Day/Prairie City area. The amount of local economic relief would be determined by whether the purchaser is local or distant, what mills(s) local or distant actually received the logs, and the price for the lumber. These cumulative economic effects could cause beneficial "quality of life" social effects, especially when combined with other ongoing Forest Service Timber sales within Grant and Harney Counties that are providing employment and income. There are foreseeable projects in the two counties in various stages of planning that potentially may add to the Forest's annual timber offerings for 2008 or 2009. For example, the Knox and Dans projects on the Prairie City Ranger District, the Crawford, Can, CC, and Balance projects on the Blue Mountain Ranger District, and the Green Ant, Ryd3 and Silvies projects on the Emigrant Creek Ranger District. These ongoing and foreseeable projects are expected to add cumulatively to the employment and income of Grant and Harney counties within the life of the Dads project.

Economic Efficiency

The economic efficiency of other past, ongoing, or foreseeable future activities would not affect, and not be affected by any effects not already described.

Heritage

Introduction

The purpose of this report is to analyze the effects of fire recovery activities proposed under the Dads Creek Wildland Urban Interface Project on cultural resources. Cultural resources are fragile and irreplaceable resources that chronicle the history of people utilizing the forested environment. Cultural resources include:

- Historic properties, places eligible for inclusion to the National Register of Historic Places (NRHP) by virtue of their historic, archaeological, architectural, engineering, or cultural significance. Buildings, structures, sites, and non-portable objects (e.g., signs, heavy equipment) may be considered historic properties. Traditional Cultural Properties (TCPs), localities that are considered significant in light of the role it plays in a community's historically rooted beliefs, customs, and practices (Parker and King, 1998), are also considered historic properties. Historic properties are subject to the National Historic Preservation Act's Section 106 review process.
- American Indian sacred sites that are located on federal lands. These may or may not be historic properties.
- Sites of cultural use of the natural environment (e.g., subsistence use of plants or animals), which must be considered under the National Environmental Policy Act.

Regulatory Framework

The legal framework that mandates the Forest to consider the effects of its actions on cultural resources is wide-ranging. In this case, Section 106 of the National Historic Preservation Act (NHPA) of 1966 (amended in 1976, 1980, and 1992) is the foremost legislation that governs the treatment of cultural resources during project planning and implementation. Implementing regulations that clarify and expand upon the NHPA include 36 CFR 800 (Protection of Historic Properties), 36 CFR 63 (Determination of Eligibility to the National Register of Historic Places), and 36 CFR 296 (Protection of Archaeological Resources). The Pacific Northwest Region (Region 6) of the Forest Service Advisory Council on Historic Preservation (ACHP) and the Oregon State Historic Preservation Office (SHPO) signed a programmatic agreement (PA) regarding the management of cultural resources on National Forest system lands in 2004. The 2004 PA outlines specific procedures for the identification, evaluation, and protection of cultural resources during activities or projects sponsored by the Forest Service. It also establishes the process that the SHPO utilizes to review Forest Service undertakings for NHPA compliance.

The National Environmental Policy Act (NEPA) of 1969 is also a cultural resource management directive as it calls for agencies to analyze the effects of their actions on socio-cultural elements of the environment. Laws such as the National Forest

Management Act (NFMA) of 1976, the Archaeological Resources Protection Act (ARPA) of 1979, the Native American Graves Protection and Repatriation Act (NAGPRA) of 1990, and Executive Order 13007 (Indian Sacred Sites) Executive also guide Forest Service decision-making as it relates to Heritage. The American Indian Religious Freedom Act (AIRFA) of 1978 requires that federal agencies consider the impacts of their projects on the free exercise of traditional Indian religions. Executive Order 13175 (EO 13175), Consultation and Coordination with Indian Tribal Governments, November 6, 2000, directs federal agencies to engage in regular and meaningful consultation and collaboration with tribal officials in the development of federal policies that have tribal implications and to strengthen the United States government-to-government relationship with Indian tribes.

The Malheur National Forest Land and Resource Management Plan tiers to the previously mentioned laws and corresponding Forest Service direction as it sets forth resource management goals, objectives, and standards. Forest-wide management standards that are pertinent for this cultural resource effects analysis include:

- Conduct a professionally supervised cultural resource survey on National Forest lands to identify cultural resource properties. Use sound survey strategies and the Malheur National Forest Cultural Resource Inventory Survey Design (Thomas 1991).
- Evaluate the significance of sites by applying the criteria for eligibility to the National Register of Historic Places.
- Consider the effects of all Forest Service undertakings on cultural resources. Coordinate the formulation and evaluation of alternatives with the State cultural resource plan, the State Historic Preservation Office and State Archaeologist, other State and Federal agencies, and with traditional and religious leaders of Native American Indian groups and tribes with historic ties to the project planning area.

Consultation with Others

Many of the previously described laws, regulations, and directives instruct the Forest Service to consult with American Indian tribes, the state, and other interested parties on cultural resource management issues. This consultation has been conducted through the NEPA process and under the terms of existing agreements with American Indian Tribes. Documentation of compliance with the NHPA is currently being prepared for referral to the Oregon SHPO in accordance with the 2004 PA, and consultation with that agency will be completed prior to the publication of the Dads Creek Wildland Urban Interface Project Final Environmental Statement.

Tribal consultation on a government-to-government basis is ongoing with the Burns Paiute Tribe, the Confederated Tribes of the Umatilla Indian Reservation, and the Confederated Tribes of Warm Springs Reservation. At this point in the consultation process no concerns regarding the effects of the thinning and fuels proposals on cultural resources have been identified.

Analysis Methods

The Dads Creek planning area includes all National Forest system lands administered by the Blue Mountain and Prairie City Ranger Districts that are within the designated boundary established for this project. The cultural resources effects analysis will focus on cultural properties identified within the Dads Creek planning area. The proposed action does not have potential to have indirect effects (i.e., visual, auditory, atmospheric) on cultural resources that are distant from the project.

Affected Environment

Cultural resource identification efforts in the vicinity of the Dads Creek planning area have focused on three primary types of resources: prehistoric archaeological sites, historic archaeological sites, and places that support resources of contemporary tribal interest.

There have been three cultural resource inventories previously conducted within areas of the Dads Creek WUI project (Scamp, N. Fopian, Alarm, Danish and Spring Timber Sales CRIS 646-86/038; Genesis CRIS 646-91/085; Dixie Range Allotment CRIS 645-95/227). In 2007, over 900 acres was inventoried and an inventory report, Dads Creek Wildland Urban Interface Project CRIS, is being sent to SHPO for review. These surveys have resulted in the discovery of 35 heritage sites within the project area boundary. Of these, there are four prehistoric sites, 27 historic sites, and four with both prehistoric and historic components.

The Dads Creek WUI project area is predominantly located on the steep, south-facing slope of Dixie Mountain which is part of the Blue Mountains of eastern Oregon. This area can be described as mountainous, steep, and dissected by general southwest flowing streams. These major streams, Dads Creek, Jeff Davis Creek, and Dan's Creek are tributaries to the John Day River system. There are also numerous springs throughout the project area. Dixie Butte is located north of the project area and a major NNW-SSE ridgeline goes through the area. The Dixie Wildlife Emphasis Area, a roadless area, lies to the north and west of the project. Elevations vary from about 4,400 to 6,400 feet. Culturally important plant species, such as wild onion, current, and camas, are present in the project area although generally in sparse patches.

The Southern Blue Mountains were home to people representing the adaptive traditions of both the northern Great Basin and the southern Columbia Plateau (Burtchard 1998). Known prehistoric sites in the project area consist primarily of waste flakes associated with the manufacture of stone tools and occasional tool fragments. Sites are mostly very small, and represent expedient tool manufacture or reworking, most likely associated with modest seasonal use of the area for hunting and gathering. The presence of groundstone and scrapers at one of the larger prehistoric sites indicates plant procurement and processing. This same site has a dense and diverse lithic assemblage and possible stratified deposits of cultural materials. Other than Elko dart points (Mid-Holocene Epoch) there have been no other diagnostic projectile points identified in the lithic assemblages observed in the project area. There are numerous trails delineated on early 1900 GLO plats that go from Dixie Summit north over the Dixie Butte area to the Middle Fork John Day River. Although not identified as "Indian Trails", these originally may have been travel routes for Indian peoples going from the John Day River area to the Middle Fork area.

The historic use of the area is evidenced by a much more dense archaeological record. The uses of the project area are reflected in the form of sites related to the Sumpter Valley Railroad and railroad logging, stock grazing, mining, and Forest Service administration. The stock driveway, original Prairie City to Bates road, and the telephone lines are not eligible for the National Register of Historic Places. The Sumpter Valley Railway was listed on the National Register of Historic Places in 1987. A small number of test pits associated with mining have been identified in at least three locations and shafts, adits and cabins are also present on this landscape. Overall, the historic use of the area has been more intense than prehistoric use with over 75% of the cultural sites observed in the project area having historic components.

Project Design Features

Project design elements will be observed during implementation of the proposed action in order to avoid or minimize impacts to archaeological sites in the Dads WUI project area. They are listed in Chapter 2.

Environmental Consequences

Common to All Alternatives

Direct Effects

All alternatives are expected to have no, or extremely minor, direct effects on all known heritage sites within the project area. In most cases sites will be avoided throughout the lifetime of any of the proposed actions.

Indirect Effects

The primary indirect effect of all alternatives on heritage resources would be the potential for increased erosion of the site matrix for those sites with intact buried components. None of the known sites have identified intact buried components and most are situated in topographic settings with shallow soils that suggest intact buried components are extremely unlikely. The only possible exception is site A646-1890 that is located in a small meadow with associated drainages, springs and Dan's Creek on the south boundary of the site. This setting would be conducive to an intact buried component.

Since all known sites will be avoided and extensive soil protection project design features are in place, no or minimal indirect effects on known and unknown heritage resources are expected under all alternatives.

Also, indirectly, reducing the accumulations of fuels through commercial thinning will reduce the severity of potential wildfires and will enhance the long term stability of archaeological and historic resources within lands adjacent to the Dads project.

Cumulative Effects

Past, ongoing and foreseeable actions that have effected and may continue to effect heritage resources in the project area include timber harvest, prescribed fire, wildfires and associated suppression and rehabilitation activities, mining, livestock grazing, Forest administration activities, road, trail, and railroad spur construction and maintenance, and dispersed recreational use. Historic high levels of cattle and sheep grazing, particularly before the middle 20th century, likely caused directed effects through trampling of artifacts and indirect effects through soil erosion. Some level of artifact removal by workers and recreational visitors has most certainly occurred, and likely continues at a reduced rate. Past road construction has caused the most significant direct effects to those sites where a road passed through. Timber harvest has mostly occurred relatively recently and to a limited extent. Direct and indirect effects to heritage sites by timber harvest activities have been minimal. With the implementation of the project design elements for heritage resources, there is minimal risk of additional incremental degradation of the cultural properties associated with the proposed action for this project.

However, most potential impacts that heritage sites might incur from such foreseeable future actions such as noxious weed treatment, prescribed burning, constructing protective Quaking aspen fences, and livestock grazing and improvements would be mitigated as per Stipulation III. A. of the 2004 Programmatic Agreement with SHPO.

Alternative 1 – No Action

Direct Effects

Alternative 1, the No Action alternative, would cause no direct effects to known or unknown cultural resources.

Cumulative Effects

Alternative 1, the No Action Alternative, would cause no cumulative impacts to known or unknown cultural resources.

Alternative 2 – Proposed Action

Direct Effects

Alternative 2 could possibly cause direct effects on undiscovered heritage resources. This possibility is addressed in the project design criteria that state that if cultural resources are located during implementation, work will be halted and the Zone Archaeologist will be notified. The cultural resource will be evaluated, and a mitigation plan developed in consultation with the Oregon State Historic Preservation Office (SHPO) if necessary. In most cases these affects should they occur, would be minor and unlikely to cause a significant impact.

Some habitat for plants that are traditionally important to the regional tribes of American Indians may be enhanced by the vegetation treatments of this alternative. Riparian dependent species such as willow will realize some long-term benefits as fuel loading is reduced and there is a natural reestablishment of native vegetation. Cultural plant stands in upland areas may realize a limited positive effect under the alternative as fuel loading is addressed across the landscape.

Cumulative Effects

Alternative 2, the proposed action, could possibly cause limited cumulative impacts on known and unknown heritage resources. These could include unintentional direct effects to unknown sites and potential for artifact removal. Overall these potential cumulative impacts, should they occur, will only result in a minimal effect to heritage site integrity.

Consistency with Direction and Regulations

Heritage and Tribal interests are regulated by federal laws that direct and guide the Forest Service in identifying, evaluating and protecting heritage resources. The proposed action would comply with federal laws. The Malheur National Forest Plan tiers to these laws, therefore the proposed action will meet Forest Plan standards. With the completion of the Heritage inventory under the terms of the 2004 PMOA and by providing the interdisciplinary team with appropriate input as per NEPA, all relevant laws and regulations have been met.

Irreversible and Irretrievable Commitments

There are no irreversible and irretrievable commitments of resources that may result from the proposed action with respect to cultural resources.

Inventoried Roadless, Potential Wilderness, and Areas with Undeveloped Character

Inventoried Roadless Areas (IRAs)

The term "Inventoried Roadless Area" (IRA) formerly referred to an area of at least 5,000 acres, without development and maintained roads, and substantially natural conditions that was inventoried as part of the Land and Resource Management Planning process (LRMP 46 CFR 219.27 (c)). Those IRAs for the Malheur National Forest can be found in Appendix C of the Malheur Forest Plan Final Environmental Impact Statement.

On 1/12/2001, the Department of Agriculture adopted the Final Roadless Area Conservation Rule (RACR), intended to protect and conserve inventoried roadless areas on National Forest System lands. Since adoption of the 2001 RACR, the term IRA has been defined to refer to areas identified in the set of maps published for the 2000 FEIS for that rule. The IRAs identified in the 1990 Malheur National Forest Land and Resource Management Plan (LRMP), Appendix C, were included in the Final EIS RACR.

The RACR generally prohibits new road construction and reconstruction and prohibits cutting, sale and removal of timber in IRAs. The RACR includes exceptions to these prohibitions that can be analyzed in project level analysis. However, prohibitions in the RACR cannot be changed through project scale decisions, plan amendments, or plan revisions. Direction in the RACR applies to IRAs (and only to IRAs) as long as the RACR is in force.

The Dixie Butte IRA shown in the map for the RACR is the only area near the Dad's Creek Project Area. The IRA is located just north of the project area and contains the Standard Creek Drainage. The Dixie Butte IRA boundary adjacent to the Dad's project area shown in LRMP Appendix C is the same as what is identified in the set of maps published for the RACR.

The Dad's Creek Project area boundary was designed to exclude the Dixie Butte IRA. Alternative 1 proposes no action and initiates no human caused changes to the landscape.

Alternative 2 would not affect the Dixie Butte IRA since the IRA boundary is located outside of the project area. Commercial harvest, precommercial thinning, temporary road construction activities are proposed in Units 10 and 12, which are adjacent to the IRA. Both units have been previously harvested and pre-commercially thinned. Stumps and skid trails are still recognizable in these units. Both units were previously down hill skidded and contains slopes greater than 35%. In order meet Forest Plan direction for skidding on slopes greater than 35%, a temporary road would be constructed near the top of the ridge to facilitate uphill skyline logging. The temporary road would be located a few hundred feet from the IRA boundary. To ensure that the temporary road does not facilitate future motorized access into the IRA it would be rehabilitated after use by re-contouring the road prism where possible, subsoiling, and constructing an earth berm or placing large rocks and slash at the entrance.

Potential Wilderness

Only Congress has the statutory authority to designate wilderness areas. It is within the authority of Congress to designate wilderness areas that do not meet the potential wilderness inventory criteria. Areas recommended to Congress for wilderness study or designations are those areas identified on the potential wilderness inventory and evaluated for wilderness suitability for potential addition to the National Wilderness Preservation System by forests during the Land Management Planning process using wilderness inventory criteria, outlined in the Forest Service Handbook 1909.12, Chapter 71.

Areas qualify for placement on the potential wilderness inventory if they meet the statutory definition of wilderness. The definition of wilderness as stated in the Wilderness Act of 1964 (16 U.S.C. 1131-1136, 78 Stat 890) is as follows:

"A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this chapter an area of underdeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historic value."

The process to determine if areas qualify for placement on the potential wilderness inventory is outlined in Forest Service Handbook (FSH) 1909.12 Chapter 71. Areas of potential wilderness identified through this process are called "Potential Wilderness Areas" (PWAs). The inventory of potential wilderness is not a land designation, nor does it imply any particular level of management direction or protection in association with the evaluation of these potential wilderness areas. It is completed with the express purpose of identifying all lands that meet the criteria for being evaluated for wilderness suitability and possible recommendation to Congress for wilderness study or designation (FSH 1909.12, Chapter 71). Evaluation of potential wilderness areas as potential additions to the National Wilderness Preservation System is a step that occurs during the Land Management Planning process and is also outside the scope of this analysis.

During the potential wilderness inventory, areas meeting either criteria 1 and 3; or criteria 2 and 3 below are included. In addition, areas may have improvements if they meet criteria listed in FSH 1909.12, section 71.11.

1. Area contains 5,000 acres or more.

2. Areas contain less than 5000 acres, but can meet one or more of the following criteria:

   a. Areas can be preserved due to physical terrain and natural conditions.

   b. Areas are self-contained ecosystems, such as an island, that can be effectively managed as a separate unit of National Wilderness Preservation System.

   c. Areas are contiguous to existing wilderness, primitive areas, Administration endorsed wilderness, or potential wilderness in other Federal ownership, regardless of their size.

3. Areas do not contain forest roads (36 CFR 212.1) or other permanently authorized roads.

An example of criteria for including improvements found in FSH 1909.12, Section 71.11 includes guidance for timber harvest areas. "Timber harvest areas where logging and prior road construction are not evident, Examples include those areas containing early logging activities related to historic settlement of the vicinity, areas where stumps and skid trails or roads are substantially unrecognizable, or areas where clearcuts have regenerated to the degree that canopy closure is similar to surrounding uncut areas" (FSH 1909.12, Section 71.11). During project planning, if an area meets FSH criteria for potential wilderness, the effects of the project on potential to be recommended as wilderness is analyzed and disclosed.

The Malheur National Forest, in coordination with the Umatilla and Wallowa-Whitman National Forests, is involved in a tri-forest plan revision process, referred to as the Blue Mountains Forest Plan Revision. This process stared in 2005, and there have been several reiterations of Forest wilderness potential inventory following the inventory criteria outlined in FSH 1909.12 Chapter 71. Existing inventoried roadless areas (IRAs) served as the starting point for the inventory.

In order to be consistent with the other forests, the Malheur NF made the following assumptions: forest roads would be buffered with a 300-foot buffer and past timber harvest would not meet potential wilderness inventory criteria. A potential wilderness area is an area that qualifies for placement on the potential inventory if they meet criteria as outlined in Forest Service Handbook 1909.12, Chapter 71. This inventory of potential wilderness is not a land designation, nor does it imply any particular level of management direction or protection in association with the evaluation of these potential wilderness areas. It is completed with the express purpose of identifying all lands that meet the criteria for being evaluated for wilderness suitability and possible recommendation to Congress for wilderness study or designation.

During the inventory process, maps were consulted to determine what areas contiguous to IRAs meet the potential wilderness inventory criteria. Areas with wilderness potential were identified in 2005, 2006, and 2007. Within the Dad's Creek Project area no areas with wilderness potential were identified in the 2007 inventory.

The same assumptions used during the Blue Mountains Forest Plan Revision potential wilderness inventoried process were used to validate that the Dad's Creek Project area does not contain areas that meet potential wilderness inventory criteria. ArcMap geographic information system (GIS) along with field reviews were used to make this determination.

No areas within the project area are located within a 5000 acre area meeting the criteria listed in FSH 1909.12, section 71.11 (1). No areas within the project area meet the criteria in FSH 1909.12, section 71.11(2) (a, b, or c). The project area is not contiguous to an existing wilderness, primitive area, or potential wilderness area. The project area is contiguous to the Dixie Butte IRA, however the adjacent portion of the Dixie Butte IRA contains existing forest roads and does not meet potential wilderness criteria. The Project area is located south of Dixie Butte and adjacent to the Dixie Butte IRA. The areas adjacent to the IRA, proposed for commercial harvest or precommercial thinning activities were field reviewed. All areas were confirmed to have evidence of past timber harvest activities including stumps and skid trails that are still recognizable. Since there are no areas that meet the potential wilderness criteria, the Dads Project would not remove any potential wilderness from inventory.

Since 2005, public comments and proposals for wilderness have been received by the Blue Mountain Revision Team. All or portions of three areas proposed by Oregon Wild, are located within the Dad's Creek Project Area. Two of these areas are located adjacent to the Dixie Butte IRA. The same assumptions used during the Blue Mountains Forest Plan Revision potential wilderness inventoried process were used to validate that these areas do not meet potential wilderness inventory criteria.

Areas of Undeveloped Character

Areas with undeveloped character include large areas without roads or other developments that have special characteristics unique to that general area.

The Dad's Project area was reviewed for areas of undeveloped character using GIS generated maps. Within the project area there are two separate areas adjacent to the Dixie Butte IRA approximately 138 acres and 110 acres in size that were evaluated for undeveloped character.

Alternative 1 proposes no action and initiates no human caused changes to the landscape in these areas.

Most of the 138 acre area is proposed for commercial thinning and/or precommercial thinning in Alternative 2. This includes all or portions of proposed Units 8, 10, 12, 14, 15, 16, 18, 20, and 50. The area has been previously harvested and pre-commercially thinned. Stumps and skid trails are still recognizable, but starting to deteriorate. A temporary road would be constructed within the area to provide skyline logging access to Units 10 and 12. To ensure that the temporary road does not facilitate future motorized access it would be rehabilitated after use by re-contouring the road prism where possible, subsoiling, and constructing an earth berm or placing large rocks and slash at the entrance.

Alternative 2 proposes approximately 10 acres (portions of units 58 and 60) of combined commercial and precommercial thinning within the 110 acre area with access provided by existing roads. All areas proposed for thinning are located within a few hundred feet of existing roads and have been previously timber harvested.

Neither area evaluated contains unique or undisturbed soil or is considered a source of high quality water or public drinking water.

In addition, no unique plant or animal communities are present in these areas. Potential habitat exists for threatened, endangered, and sensitive species dependent on large, undisturbed areas of land such as American Lynx, Gray Wolf, California Wolverine, and Pacific Fisher. However, proposed activities would either have No Effect or No Impact to these species because either no detections or sightings have occurred in the project area.

The quality and conditions of the area are largely due to past management which has facilitated the development of vegetation conditions. Past management retained and developed larger diameter trees enhancing/maintaining the scenic quality within a managed landscape, however, these area are not known to provide high quality undisturbed primitive, semi-primitive non-motorized, or semi-primitive motorized classes of dispersed recreation. The 138 acre area is surrounded by existing roads on the south and east sides, and borders roaded private land on the west side. The 110 acre area is almost segmented by (Road 2600265) an existing road that ends near the Dixie Butte IRA boundary. This area is also surrounded by existing roads on the east, south and west sides; and partially by Road 2610147 to the north.

Lastly, no traditional cultural properties, sacred sites or other locally unique characteristics are present in either area.

Findings and Disclosures

Several laws and executive orders require project-specific findings or other disclosures and are included here. The project complies with the following and other relevant legal requirements and coordination, and regulations. These apply to all alternatives considered in detail in this EA.

National Forest Management Act

All project alternatives fully comply with the Malheur Forest Plan. This project incorporates all applicable Forest Plan forest-wide standards and guidelines and management area prescriptions as they apply to the Project Area, and complies with Forest Plan goals and objectives. This includes additional direction contained in all amendments. All required interagency review and coordination has been accomplished; new or revised measures resulting from this review have been incorporated.

The Forest Plan complies with all resource integration and management requirements of 36 CFR 219 (219.14 through 219.27). Application of Forest Plan direction for the Dads Creek WUI project ensures compliance at the project level.

The National Environmental Policy Act (NEPA) of 1969, as amended

NEPA establishes the format and content requirements of environmental analysis and documentation, such as the Dads Creek WUI Project. This project is consistent with all requirements.

Congressionally Designated Areas

Wilderness: There are no lands designated in the project area as wilderness; therefore, there would be no impacts on Wilderness. (See discussion on Inventoried Roadless, Potential Wilderness, and Areas with Undeveloped Character Section).

Wilderness Study Areas (WSA): There are no lands designated in the project area as Wilderness Study Areas or recommended for Wilderness classification; therefore, there would be no impacts on any WSA.

National Recreation Area: There are no lands designated in the project area as National Recreation Areas; therefore, there would be no impacts to National Recreation Areas.

Facilitation of Hunting Heritage and Wildlife conservation: (Executive Order 13443)

The purpose of this 2007 Order is to direct Federal agencies that have programs and activities that a measurable effect on public land management, outdoor recreation, and wildlife management, including Department of the Interior and Department of Agriculture, to facilitate the expansion and enhancement of the hunting opportunities and management of game species and their habitat. Federal agencies shall evaluate the effect of agency actions on trends in hunting participation; consider the economic and recreation values of hunting in agency actions; manage wildlife and wildlife habitat on public lands in a manner that expands and enhances hunting opportunities and work collaboratively with State governments to manage and conserve game species in their habitats.

With the implementation of the proposed action there will be limited-short term effects to hunters. Harvest activities, smoke from fuel treatments, and road closures may displace some recreationists to new areas to camp, hunt or travel. It is not anticipated that activities would cause a decline in big game populations.

Treaty with the Walla Walla, Cayuse, and Umatilla Tribes, June 9, 1855, and Treaty with the Tribes of Middle Oregon, June 25,1855 and Public Law 92-488

These treaties established "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 house for curing the same; also the privilege of hunting, gathering roots and berries, and pasturing their stock on unclaimed lands, in common with citizens, is secured to them." All actions to be taken must fully consider and comply with Native American treaty rights.

The project area falls within lands ceded by the Confederated Tribes of the Warm Springs Reservation. It is south of the ceded lands of the Confederated Tribes of the Umatilla Indian Reservation but within their declared area of interest. The Project Area is within the traditional and current use area of the Burns Paiute Tribe and is north of their former Indian reservation. Law 92-488 recognizes the Burns Paiute Tribe and their reservation. As a Federally recognized tribe, the Burns Paiute Tribe retains rights of inherent sovereignty.

Parklands

There are no municipal watersheds affected by the project; therefore there would be impacts on any municipal watersheds.

Public Health and Safety

Public health and safety would be improved by reducing the potential for stand replacement wildfires near the wildland/urban interface boundary.

Relationship Between Local Short-term Uses of Man's Environment and the Maintenance and Enhancement of Long-term Productivity [42 U.S.C. 4332 (C)(iv)]

The Multiple Use - Sustained Yield Act of 1960 requires the Forest Service to manage National Forest System lands for multiple uses (including timber, recreation, fish and wildlife, range, and watershed). All renewable resources are to be managed in such a way that they are available for future generations. Maintaining the productivity of the land is a complex, long-term objective. The Proposed Action protects the long-term productivity of the area through the use of specific Forest Plan standards and guidelines, design criteria, and design measures.

Endangered Species Act (ESA)

Neither alternative is anticipated to have a direct, indirect, or cumulative effect on any threatened or endangered species in or outside the project area. Biological evaluations have been completed. Concurrences from the responsible federal agency, for any threatened or endangered species potentially inhabiting the project area were not required for this project because the Biological Evaluation determined that there are no effects to any threatened or endangered species. Consultation with NOAA or USFWS is not necessary for fisheries because the area is part of an inland fishery and contains no ESA fish species. The Magnuson-Stevens Fishery Conservation and Management Act as amended (1996) does not apply to the Project Area because it is an inland fishery.

The Migratory Bird Treaty Act of 1918 and the Migratory Bird Executive Order 13186

The purposes of this Act are to establish an international framework for the protection and conservation of migratory birds. The Proposed Action alternative has been designed to enhance landbird richness. The Proposed Action is consistent with the 1918 Migratory Bird Treaty Act (MBTA) and the Migratory Bird Executive Order 13186. The Proposed Action was designed under current Forest Service policy for landbirds. The Northern Rocky Mountains Bird Conservation Plan (Altman 2000) and the U.S. Fish and Wildlife Service's Birds of Conservation Concern (USFWS 2002) were reviewed for effects disclosure. The Proposed Action alternative was designed to protect or enhance priority habitats for landbird species, including neotropical migratory species.

Clean Water Act

The design of project activities is in accordance with Forest Plan standards and guidelines, Best Management Practices, and applicable Forest Service manual and handbook direction. Project activities are expected to meet all applicable State of Oregon water quality standards. No effects on water quality or 303(d) listed streams are expected because none of the proposed actions are expected to remove vegetation which shades streams.

Floodplains and Wetlands (Executive Orders 11988 and 11990) and Prime Farmland, Rangeland, and Forestland

Wetlands are not expected to be affected by the proposed activities because the implementation of PACFISH RHCA's is expected to be sufficient in extent to protect wetland functions. Floodplain function is not expected to be reduced compared to the existing condition by any project activities. There are no prime farmlands, or wild and scenic rivers within the project area. All alternatives are in accordance with the Secretary of Agriculture Memorandum 1827 for prime farmland, rangeland, and forestland.

Executive Order 12962 (aquatic systems and recreational fisheries)

This project is not likely to impact the quantity, function, sustainable productivity, and distribution of recreational fisheries per Executive Order 12962, Recreational Fisheries.

Executive Order 13112 (invasive species)

All alternatives are consistent with the Forest Plan and other direction with respect to invasive species.

Forest and Rangeland Renewable Resources Planning Act (RPA) of 1974 (as amended):

This act directed the Secretary of Agriculture to prepare a Renewable Resources Assessment and updates. The USDA Forest Service Forest Inventory and Analysis unit provides updates for this assessment.

National Historic Preservation Act

Cultural resource surveys of varying intensities have been conducted following inventory protocols approved by the State Historic Preservation Officer SHPO). Native American communities have been contacted and public comment encouraged. The consultation and concurrence process with SHPO has been concluded. No significant effects on known cultural resources are anticipated. The Forest Specialist has certified that for this project the Forest complies with Section 106 of the National Historic Preservation Act, under the terms of the 2004 Programmatic Agreement between Advisory Council on Historic Preservation (ACHP), SHPO, and the United States Forest Service, Region 6.

Clean Air Act

During project implementation, underburning will adhere to the Oregon Smoke Management Plan and the State Implementation Plan of the Clean Air Act. Burning will be accomplished under smoke dispersion conditions that will minimize smoke impacts and protect air quality. Conducting during air mass instability will allow a high percent of the smoke to disperse. Past experience has shown that significant air quality declines are limited in scope to the general burn area and are of short duration. Those that will most likely be impacted are residences along Dads Creek and in Prairie City. The roads in the area will be signed as necessary during implementation. The proposed activities will not significantly affect public health or safety.

Environmental Justice (Executive Order 12898)

Executive Order 12898 requires that federal agencies adopt strategies to address environmental justice concerns with the context of agency operations. With implementation of any of the proposed actions, there would be no disproportionately high or adverse human health or environmental effects on minority populations or low-income populations. There will be short term smoke impacts from prescribed burning to some of the residences along Dads Creek and in Prairie City. Racial and cultural minority groups could be in the work forces that implement project proposals. Contracts for the proposed work contain clauses that address worker safety and employment practices. Implementation of any project activities is not anticipated to cause disproportionate adverse human health or environmental effects to minority or low-income populations.

Energy Requirements and Natural or Depletable Resource Requirements and Conservation Potential:

The Dads Creek WUI Project has been designed to conform to applicable laws and regulations pertaining to natural or depletable resources, including minerals and energy resources. In terms of petroleum products, the energy required to implement any of the action alternatives is negligible when viewed in light of production costs and the effects on the national and worldwide petroleum reserves.

CHAPTER 4 – CONSULTATION AND COORDINATION

The Forest Service consulted the following individuals, tribes, Federal, state and local agencies, and non-Forest Service persons during the development of this environmental assessment:

List of Preparers

Interdisciplinary Team

Name	Expertise
Ryan Falk	Environmental Coordinator, IDT Leader
Teri Corning-Sevey	GIS/Data Services
Bill Wall	Fisheries
Mary Robertson	Archaeology
Kelly Ware	Range/Noxious Weeds
Kim Conlee	Engineering and Transportation Planning
Charlotte McCumber	Logging Systems/Economics
Robert (Hersh) McNeil	Soil Science
Andy Daniels	Wildlife Biology
Roy Walker	Fire and Fuels Management
Linda Batten	Hydrology
Eric Wunz	Silviculture, IDT Leader
Cindy Kranich	Botany
Roy Beal	Visuals/Scenery
Shannon Winegar	Recreation

Contributors

Tribes

Confederated Tribes of the Warm Springs Reservation

Confederated Tribes of the Umatilla Indian Reservation

Burns Paiute Tribe

Federal, State, and Local Agencies

Bureau of Land Management (BLM), John Day

USDI, United State Fish and Wildlife Service

National Oceanic and Atmospheric Administration (NOAA) Fisheries

Oregon State Historic Preservation Office (SHPO)

Oregon Department of Fish and Wildlife

Oregon Department of Forestry

OSU Extension Service

Grant County Court

Collaborators (those listed on the sign-in sheets for formal meetings)

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Glen Johnson and Peggy Murphy

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George Meridith

Dan Bishop

Karen Coulter

Tim Lillebo

Irene Jerome

Blue Mountain Forest Partners

The Blue Mountain Forest Partners is working with the Malheur NF to design forest restoration projects to improve the forest and local economies. A sub-group was formed to work on the Dads WUI project, its members include:

Karen Coulter

Asante Riverwind

Tim Lillebo

James Johnston

Jeff Fields

Mike Billman

Charlie O'Rorke

Dan Bishop

Irene Jerome

Emily Platt

Persons who responded during the scoping process

Chandra LeGue	Oregon Wild
Asante Riverwind	Sierra Club
Karen Coulter	Blue Mtn. Biodiversity Project
Phil Turrell	Harney Co. Chapter, Rocky Mtn. Elk Foundation
Ryan Torland/Tim Unterwegner	Oregon Dept. of Fish and Wildlife

CHAPTER 5 – REFERENCES CITED

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Appendix A - Unit Information

Introduction

This appendix lists the various actions incorporated into the treatment units. Refer to the maps in Appendix B for the locations of the units and a graphic representation of the treatments. Detailed information is in Table A-1 starting on the next page.

Treatment Method Legend and Acres Treated Summaries

Acres are approximate and subject to change during implementation.

Silvicultural Prescriptions – 2668 Acres Total
HRS - Conversion to Early Seral Species - 28 acres
HTH - Commercial Thin to average of 50 ft^2/acre basal area - 755 acres
HTH/PCT - Commercial Thin and Precommercial Thin - 666 acres
HUR - Understory Removal - 362 acres
PCT – Precommercial Thin to 9" DBH - 799 acres
DOGE – Designated Old Growth Enhancement – 58 acres of actual treatment across 145 acres of Designated Old Growth

Underburning – 2532 Acres Total
Rx Burning in areas with Mechanical Treatment – 1467 acres
Rx Burning Only – 1065 acres

Logging System
T - Tractor - 1290 acres
T/TW - Tractor /Tractor Winch – 401 acres
TW – Tractor Winch – 25 acres
T/S – Tractor/Skyline – 227 acres
S – Skyline - 124 acres

Fuel Treatment
WTY – Whole Tree Yarding – 1145 acres
GP – Grapple Piling - 493 acres
HP – Hand Piling - 206 acres
WTY/GP - Whole Tree Yarding and Grapple Piling - 334 acres
WTY/HP - Whole Tree Yarding and Hand Piling – 332 acres
SWP – Swamper Burn Piles – 58 acres

Post Harvest Treatment
Potential Biomass – 605 acres
UTR – Undesirable Tree Removal - 28 acres
Plant – Planting of Early Seral Species - 28 acres

Table A-1: Unit Information

Unit Number	Silv Rx	New DOG/ ROG	Rx Fire	Logging System	Fuel Treatment *	Post Harvest Treatment	Plant	Acres
2	HTH		Underburn	T	WTY			68
4	PCT		Underburn	T	GP	Biomass		9
6	PCT		Underburn	T	GP	Biomass		8
8	PCT		Underburn		HP			20
10	HTH		Underburn	T	WTY			18
12	HTH		Underburn	T/S	WTY			92
14	HTH/PCT		Underburn	T	WTY/GR	Biomass		14
15	PCT		Underburn	T	GP	Biomass		5
16	PCT		Underburn		HP			7
18	HTH/PCT		Underburn	S	WTY/HP			20
20	PCT		Underburn		HP			11
22	HTH		Underburn	T/S	WTY			64
24	HTH/PCT		Underburn	T/TW	WTY/GR	Biomass		13
25	HTH/PCT		Underburn	TW	WTY/GR	Biomass		5
26	PCT		Underburn		HP			18
28	HTH			S	WTY			32
30	HTH/PCT			T/TW	WTY/GR	Biomass		27
32	HTH/PCT		Underburn	T	WTY/GR	Biomass		13
33	HTH		Underburn	T	WTY			13
34	HTH		Underburn	T/TW	WTY			22
36	HTH/PCT		Underburn	T	WTY/GR	Biomass		64
38	HTH		Underburn	T	WTY			36
40	HTH/PCT		Underburn	T	WTY/GR	Biomass		9
42	PCT		Underburn	T	GP	Biomass		14
43	PCT		Underburn	T	GP	Biomass		6
44	HTH		Underburn	T/TW	WTY			11
46	HTH/PCT		Underburn	T/TW	WTY/HP			27
48	HTH		Underburn	T/TW	WTY			54
50	HTH/PCT		Underburn	T/S	WTY/HP			71
51	HTH/PCT			S	WTY/HP			15
52	HTH/PCT			S	WTY/HP			33
54	HTH			T	WTY			15
56	HUR			T	WTY			14
58	HTH/PCT			T	WTY/GR	Biomass		38
60	HTH/PCT			T	WTY/HP			18
64	HUR			T	WTY			8
66	HUR			T/TW	WTY			25
67	HUR			T/TW	WTY			15
68	PCT			T	GP	Biomass		11
72	PCT			T	GP	Biomass		10
74	HTH/PCT			T/TW	WTY/HP			41
76	HTH			T	WTY			46

78	HRS			T	WTY	UTR	Plant	28
80	HTH		Underburn	T	WTY			66
82	HUR		Underburn	T	WTY			14
84	HTH/PCT			T	WTY/GR	Biomass		9
86	HTH/PCT		Underburn	T	WTY/GR	Biomass		37
88	HTH		Underburn	T	WTY			54
90	HTH		Underburn	T	WTY			8
92	HTH		Underburn	TW	WTY			12
94	HTH/PCT		Underburn	T/TW	WTY/GR	Biomass		70
96	HTH/PCT			T/TW	WTY/GR	Biomass		20
98	HTH		Underburn	T	WTY			33
100	HTH		Underburn	T	WTY			55
102	HTH			T	WTY			5
104	HTH			T	WTY			10
106	HTH/PCT		Underburn	T	WTY/HP			9
108	HTH/PCT		Underburn	T	WTY/HP			34
110	HTH/PCT			T	WTY/HP			4
112	HTH/PCT		Underburn	T	WTY/HP			27
114	HTH/PCT		Underburn	T	WTY/GR	Biomass		15
116	HTH		Underburn	T	WTY			9
118	HTH			T	WTY			3
120	HTH/PCT		Underburn	T/TW	WTY/HP			33
122	PCT				GP			13
124	PCT			T	GP	Biomass		10
125			Underburn					2
126			Underburn					9
127			Underburn					3
128			Underburn					2
129			Underburn					8
130			Underburn					12
131			Underburn					12
132			Underburn					21
133			Underburn					14
134			Underburn					130
135			Underburn					5
136			Underburn					46
138			Underburn					8
140			Underburn					39
142			Underburn					24
144			Underburn					21
145			Underburn					6
146			Underburn					12
148			Underburn					27
150			Underburn					79
152	PCT			T	GP	Biomass		12
154	HTH			T	WTY			6
156	PCT		Underburn			Biomass		15

158	PCT				GP			20
160	PCT				GP			7
162	PCT				HP			8
164			Underburn					9
166	PCT		Underburn	T		Biomass		28
168	HTH		Underburn	T	WTY			23
170	PCT		Underburn	T		Biomass		9
172	PCT		Underburn	T		Biomass		48
174			Underburn					32
176			Underburn					16
178			Underburn					11
180			Underburn					88
182			Underburn					126
184			Underburn					19
186	HUR		Underburn	S	WTY			24
188	HUR			TW	WTY			8
190	PCT				HP			16
192	HUR			T	WTY			25
194	PCT				GP			35
196		DOG						5
198		DOG						23
200		DOG						33
202		DOG						5
204		DOG						8
206		DOGE			SWP			26
208		DOGE			SWP			28
209		DOGE			SWP			35
210		DOG						38
211		DOGE			SWP			27
212		DOGE			SWP			8
214		DOGE			SWP			21
216		DOG						9
218		DOG						38
220	HUR		Underburn	T/TW	WTY			43
222	HUR		Underburn	T	WTY			44
224			Underburn					14
226			Underburn					34
228			Underburn					16
230	HUR		Underburn	T	WTY			45
232		DOG						18
234			Underburn					36
236			Underburn					12
238			Underburn					26
240			Underburn					75
242			Underburn					32
244			Underburn					39
246		ROG						81

248		ROG						65
250		ROG						104
252	HUR			T	WTY			20
254	HUR			T	WTY			15
256	PCT				GP			33
258	PCT			T	GP	Biomass		9
260	PCT				GP			8
262	PCT				GP			8
264	HUR			T	WTY			25
266	PCT				HP			14
268	PCT				GP			16
270	PCT				HP			22
272	PCT				HP			7
274	PCT				GP			19
276	PCT				HP			37
278	PCT				GP			4
280	PCT			T	GP	Biomass		30
282	PCT				GP			115
284	PCT				GP			16
286	PCT				HP			10
288	PCT				GP			10
290	PCT				HP			26
292	PCT				HP			10
294	PCT				GP			18
296	PCT			T	GP	Biomass		47
298	HUR			T	WTY			37
		322 **250** **572**	**Designated Old Growth Acres** **Replacement Old Growth Acres** **DOG/ROG Acres**			**Total Acres of Treatment***		**4135**

Most units can supply small diameter logs for non-sawlog uses if there is an economic market for the material. The likely areas for this to occur are the tractor logging system units, due to lower costs.

*Total acres with either mechanical thinning, underburning, or both treatments.

Appendix B – Maps

Appendix C - Cumulative Activities Considered

Introduction

This appendix discloses actions considered in the cumulative effects sections of each resource in Chapter 3. In most cases, past and ongoing activities are incorporated into each resource's existing conditions because they help explain the current condition of the resource. Past and ongoing activities are also considered in cumulative effects in the context of how past or ongoing actions affect present conditions and how future actions increase, reduce, or do not change these conditions. This list includes all reasonably foreseeable projects expected to occur within each resources' defined scope of analysis (including all projects that overlap each resources cumulative impact area). This listing is consistent with the Council on Environmental Quality guidance letter of June 24, 2005.

Past Activities

Table C-1 Past Timber Sales (Dad's Creek Project Area)

Year Harvested	Sale Name	Harvest Acres	Harvest Type Tractor (T), Skyline (S), Helicopter (H)	Harvest Prescription**
1910 -20	Railroad Logging*	Unknown	Horse & RR	HPR
1991	Mino 1	45	T	HPR
1989	Skibowl 04	17	T	HCC
1990	Skibowl 09	9	T	HCC
1992	Skibowl 23	11	T	HCC
1992	Skibowl 24	10	T	HCC
1983	GLA 01	54	T	HFR
1983	GLA 02	19	T	HFR
1983	GLA 03	15	T	HFR
1983	GLA 04	13	T	HCR
1983	GLA 05	10	T	HCR
1984	GLA 07	7	T	HPR
1983	GLA 08	35	T	HFR
1983	GLA 09	32	T	HFR
1986	GLA 12	75	T	HTH
1991	Danish 1	80	T	HPR
1993	Danish 1	100	T	HCR
1990	Danish 2	188	T	HOR
1981	Danish 3	18	T	HSH
1988	Danish 3	27	T	HSH
1990	Danish 4	142	T	HOR
1990	Danish 6	65	T	HOR
1981	Danish 7	106	T	HPR
1991	Danish 7	11	S	HOR

1990	Danish 8	7	T	HCR
1988	Danish 9	34	T	HCR
1989	Danish 10	75	T	HOR
1988	Danish 11	37	T	HSH
1988	Danish 12	27	T	HSH
1981	Danish 13	56	T	HSH
1989	Danish 13	25	T	HCR
1988	Danish 14	58	T	HOR
1991	Danish 20	31	T	HCR
1988	Danish 21	16	T	HFR
1991	Danish 26	44	S	HOR
1991	Danish 27	26	S	HCR
1990	Danish 28	14	T	HCR
1990	Danish 32	6	T	HOR
1990	Danish 34	31	T	HOR
1988	Danish 50	14	T	HCC
1988	Danish 52	33	T	HCR
1993	Tape 1	100	T	HCC
1993	Eden 1	27	T	HSA
1993	Eden 11	20	T	HSA
1993	Eden 26	32	S	HCR
1993	Eden 31	14	S	HSH
1993	Eden 33	10	S	HCR
1993	Eden 34	22	S	HSH
1993	Eden 36	18	T	HSH
1993	Eden 35	4	T	HCR
1993	Eden 49	22	S	HSH
1994	Raven 2	21	H	HCR
1993	Raven 3	34	H	HSA
1994	Raven 4	158	H	HSL
1993	Raven 6	64	H	HSA
1993	Raven 8	25	H	HSH
1993	Raven 12	19	H	HSA
1993	Raven 13	21	H	HSH
1993	Raven 15	23	H	HSH
1993	Raven 16	35	H	HSL
1993	Raven 18	107	H	HSH
1994	Raven 19	17	H	HSG
1993	Raven 53	63	H	HSL
1994	Raven 59	12	H	HSA
1993	Snake 22	8	T	HSH
1993	Snake 24	12	T	HSH
1994	Snake 25	97	T	HCR
1994	Snake 29	73	S	
1993	Snake 30	33	S	HSA
1993	Snake 32	60	S	HCR
1997	Bumblebee Blowdown	116	T	HSV

* These areas are broadly mapped; minimal historical records.

** Harvest Prescription Definitions

- Commercial Thinning (HTH) -
- Regeneration Harvest: even aged management; the stands naturally or artificially regenerated.
  - (HCC)- clearcut
  - (HSH) Shelterwood
  - (HCR) - seedtree
- Overstory Removal (HOR)- Harvest overstory removal
- Final Removal (HFR) - final removal of mature overstory to release established immature crop tree that were not a result of a prescribed regeneration cut.
- Partial Removal (HPR)
- Selection Harvest (HSL)

Table C-2 Past Wildfires

Year	*Fire Name	Acres	Description
1997	Incident 029	161 acres (approximately 10 acres are located within the Dad's Creek Subwatershed.	Fire suppression and rehabilitation.

*Records for larger wildfires (over 100 acres) within the Dad's Creek Subwatershed. Additional small fires have occurred and been suppressed throughout the Subwatershed and Dad's Project area.

Table C-3 Past Prescribed Burning

Project	Unit Number	Treatment Type*	Date	Acres
DANISH_II	20	BC	5/25/1994	31
DANISH_II	50	BC	5/1/1989	14
RAVEN	15	BC	8/13/1999	0
SNAKE	25	BC	10/3/1997	95
SNAKE	22	BC	5/20/1997	8
SNAKE	25	BC	5/20/1997	0
SNAKE	24	BC	5/20/1997	10
SNAKE	32	BC	5/20/1997	60
EDEN	26	BC	9/30/1994	32
DANISH_II	27	BC	5/22/1993	26
EDEN	33	BC	9/30/1994	10
EDEN	35	BC	9/30/1994	4
RAVEN	53	BC	9/30/1999	62

RAVEN	3	UB	9/30/1999	34
RAVEN	13	UB	9/30/1999	21
EDEN	11	UB	9/30/1994	20
EDEN	31	UB	9/30/1994	14
EDEN	34	UB	9/30/1994	22
EDEN	36	UB	9/30/1994	18
SNAKE	30	UB	10/8/1998	33
EDEN	49	UB	9/30/1994	0
			Total	**514**

*Burn Prescriptions

- BC – Broadcast Burn
- UB - Underburn

Table C-4 Outfitter Guides

Year	Outfitter	Permit	Outfitter Type	Hunt Unit
	None Known			

Table C-5 Noxious Weed Sites and Control

Year	Activity	Inventoried Sites In Or Near the Dad's Project Area	Weed Types	Total Acres of Inventoried Sites
First sites inventoried in 1985 and updates ongoing	Annual Treatments All sites were treated in July 2008 Previous treatments have occurred in 1995-1997 and 2002-2005	06040300843	DALMATIAN TOADFLAX	0.11
		06040300844	YELLOW TOADFLAX	0.11
		06040300847	SPOTTED KNAPWEED	0.15
		06040300848	DALMATIAN TOADFLAX	0.11
		06040300849	SPOTTED KNAPWEED	0.11
		06040300850	DALMATIAN TOADFLAX	0.40
		06040300851	DALMATIAN TOADFLAX	0.11
		06040300883	DIFFUSE KNAPWEED	0.76
		06040400001	DIFFUSE KNAPWEED	0.29
		06040400002	DIFFUSE KNAPWEED	0.28
		06040400079	DIFFUSE KNAPWEED	0.11
		06040400082	DALMATIAN TOADFLAX	1.99
		06040400086	DALMATIAN TOADFLAX	0.47
		06040400087	DALMATIAN TOADFLAX	0.11
		06040400124	DIFFUSE KNAPWEED	0.10
		06040400125	DIFFUSE KNAPWEED	0.10

		06040400126	CANADA THISTLE	0.10
		06040400127	CANADA THISTLE	0.10
		06040400128	DALMATIAN TOADFLAX	0.10
		06040400129	CANADA THISTLE	0.10
		06040400131	DIFFUSE KNAPWEED	0.10
		06040400132	DIFFUSE KNAPWEED	0.10
		06040400133	DIFFUSE KNAPWEED	0.10
		06040400134	DALMATIAN TOADFLAX	0.10
		06040400135	DALMATIAN TOADFLAX	0.10
		06040400136	CANADA THISTLE	0.10
		06040400137	CANADA THISTLE	0.10
		06040400138	DALMATIAN TOADFLAX	0.10
		06040400139	DALMATIAN TOADFLAX	0.10
		06040400140	DALMATIAN TOADFLAX	0.10
		06040400141	DIFFUSE KNAPWEED	0.10
		06040400142	CANADA THISTLE	0.10
		06040400143	CANADA THISTLE	0.10
		06040400144	DIFFUSE KNAPWEED	0.10
		06040400145	DALMATIAN TOADFLAX	0.10
		06040400146	DALMATIAN TOADFLAX	0.10
		06040400147	DIFFUSE KNAPWEED	0.10
		06040400149	CANADA THISTLE	0.10
		06040400150	CANADA THISTLE	0.10
		06040400151	DIFFUSE KNAPWEED	0.10
		06040400152	DIFFUSE KNAPWEED	0.10
		06040400224	CANADA THISTLE	0.10
		06040400225	DIFFUSE KNAPWEED	0.10
		06040400226	DALMATIAN TOADFLAX	0.10
		06040400227	DIFFUSE KNAPWEED	0.10
		06040400228	CANADA THISTLE	0.10
		06040400229	DALMATIAN TOADFLAX	0.10
		06040400230	DIFFUSE KNAPWEED	0.10
		06040400231	DALMATIAN TOADFLAX	0.10
		06040400232	CANADA THISTLE	0.10
		06040400233	CANADA THISTLE	0.10
		06040400234	DIFFUSE KNAPWEED	0.10
		06040400235	DALMATIAN TOADFLAX	0.10
		06040400236	CANADA THISTLE	0.10
		06040400237	DALMATIAN TOADFLAX	0.10
		06040400238	DIFFUSE KNAPWEED	0.10
		06040400239	DIFFUSE KNAPWEED	0.10
		06040400240	TEASEL	0.10
		06040400241	DALMATIAN TOADFLAX	0.10
		06040400242	DIFFUSE KNAPWEED	0.10
		06040400243	DALMATIAN TOADFLAX	0.10
		06040400244	DIFFUSE KNAPWEED	0.10
		06040400245	DALMATIAN TOADFLAX	0.10
		06040400246	DIFFUSE KNAPWEED	0.10
		06040400247	DALMATIAN TOADFLAX	0.10
		06040400248	DALMATIAN TOADFLAX	0.10

		06040400249	DIFFUSE KNAPWEED	0.10
		06040400250	HOUNDSTONGUE	0.10
		06040400252	DIFFUSE KNAPWEED	0.10
		06040400253	CANADA THISTLE	0.10
		06040400254	DIFFUSE KNAPWEED	0.10
		06040400255	DALMATIAN TOADFLAX	0.10
		06040400256	DALMATIAN TOADFLAX	0.10
		06040400257	DALMATIAN TOADFLAX	0.10
		06040400258	DIFFUSE KNAPWEED	0.10
		06040400259	DALMATIAN TOADFLAX	0.10
		06040400260	DALMATIAN TOADFLAX	0.10
		06040400261	DALMATIAN TOADFLAX	0.07
		06040400262	DALMATIAN TOADFLAX	0.10
		06040400263	DALMATIAN TOADFLAX	0.10
		06040400264	DALMATIAN TOADFLAX	0.10
		06040400265	DIFFUSE KNAPWEED	0.10
		06040400269	ST. JOHNSWORT	0.10
		06040400270	DIFFUSE KNAPWEED	0.10
		06040400328	DALMATIAN TOADFLAX	2.78
		06040401141	DALMATIAN TOADFLAX	0.10
		06040401149	DALMATIAN TOADFLAX	0.07
		06040401151	ST. JOHNSWORT	0.10
		06040401152	DIFFUSE KNAPWEED	0.10
		06040401153	ST. JOHNSWORT	0.10
		06040401154	SPOTTED KNAPWEED	0.10
		06040401155	ST. JOHNSWORT	0.10
		06040401156	DALMATIAN TOADFLAX	0.07
		06040401158	DALMATIAN TOADFLAX	0.07
		06040401159	DALMATIAN TOADFLAX	0.10
		06040401200	DALMATIAN TOADFLAX	0.10
		06040401201	DALMATIAN TOADFLAX	0.10
		06040401203	SPOTTED KNAPWEED	0.10
		06040401204	DALMATIAN TOADFLAX	0.10
		06040400701	MEADOW KNAPWEED	0.18
			Total Acres	**16.37**

Table C-6 Other Past Activities

Year	Activity	Description
Early 1800's until 1860	Wagon Trails	One of the wagon trails came from the Baker City area in the general location of Highway 26.
1862 until present	Mining	Silver Bow Mine – Located in T. 12 S. R. 34 E. Section 9. Mine is abandoned. Boulder Group Mine – Located in T. 12 S., R. 34 E. Section 4. Mine was abandoned and re-activated (re-filed in October, 2005). Active Mining Claim (name not known)- Located in T. 12. S., R. 34 E., Section 9 (NE ¼). Mine and camp are located at the end of Road 233, which is behind the pole gate on Road 301.
Late 1800's until present	Water withdrawal for irrigation/domestic water	Two irrigation ditches with points of diversion located in T. 12 S., R 34 E., Section 9. Both ditch right-of-ways runs through sections 9 and 17. Both ditches divert water from Dad's Creek to the Pat Voight Ranch (historically Ernest Ricco Ranch). In recent years one of the ditches failed and caused resource damage to FS Road 2600-369.
Early 1900's	Firewood Cutting	Firewood cutting throughout the project area. Firewood cutting access increased in the 1920's as the existing transportation system was established.
Early 1900's until present	Historic livestock grazing.	Grazing has been occurring in this area since the early days of settlement. Both sheep and cattle were grazed in the beginning, but only cattle graze now. The entire Dad's Watershed was grazed by both sheep and cattle predating the establishment of the Malheur National Forest.
Early 1900's until 1948	Sumpter Valley Railroad line and spur lines	In 1905, the Sumpter Valley Railroad laid tracts into Austin. The last Sumpter Valley Railroad train ran in 1948. Historic railroad spur lines are located in the Dad's Creek project area.
1900's until present	Summer Recreation	Within the Dad's Creek subwatershed the probability of recreation use was low prior to 1929. Historic recreation use in the Project Area includes hunting, camping, mushroom picking, huckleberry picking, shed antler hunting, Christmas tree cutting, and sight-seeing. In recent years recreational use of ATVs has become prevalent.

1900's until present	Fall Recreation (Hunting and Camping	Big game hunting for deer, elk, bear, and cougar. The Dad's project area includes part of the Northside Hunting Unit (north of Hwy. 26), and Beulah Hunting Unit (south of Hwy. 26). -Deer (Northside Hunting Unit) – Late Sept. to Early October (2007-1,430 Buck Tags). -Deer (Beulah Hunting Unit)-Late Sept. to Early October (2007-2,268 Buck Tags). -Elk (Northside Hunting Unit)- Late October to Early Nov. (2007- 409 Tags – One bull elk). -Elk (E. Northside)- November (2007-398 Tags- One Elk). -Elk (W. Beulah #1)- Late October to Early Nov. (2007-385 Tags- One bull elk). -Elk (W. Beulah #2)- November (2007- 540 Tags – One Elk). General Bow Seasons (Deer and Elk) – Late August to Mid September (Unlimited Tags). Hunting for ruffed and blue grouse.
1920's until present	Forest Service road building	First road building was for access for fire fighting. Developing transportation system provided access to miners, loggers, and cattle and sheep ranchers. Old routes were low grade and followed many of the old railroad grades.
1920's until present	Use and maintenance of National Forest Roads	Use and maintenance of approximately open roads on National Forest System lands in the Dad's Creek Subwatershed. Road maintenance includes cleaning of culverts, blading of existing roads, brushing of right of ways.
1930's until present	Construction of State Highway 26	Highway was constructed in the 1930s. Highway 26 runs through the center of the Dad's Creek subwatershed. The northern half of the subwatershed is on the Blue Mt. Ranger District, the southern half on the Prairie City Ranger District.
1960's to present	Powerline Special Use Permit (OTEC)	Electrical overhead power transmission line that runs from Bates to the Forest Boundary is approximately 7.3 miles. The line runs through the Dad's Creek subwatershed in T. 12 S, R. 34 E. Sections 10, 15, and 16 (approximately 1 mile in lenghth). Within the Dad's Creek project area the power line shares a common right-of-way with the Idaho Power overhead transmission line listed below.
1965 to present	Powerline Special Use Permit (Idaho Power)	Electrical overhead power transmission line run through the Dad's Creek Subwatershed. Power line right-of-way is located in T. 12S. R. 34 E., Sections 10, 15, and 16. Shares common righ-of-way with the OTEC transmission line listed above.

1965 to present	Buried Phone Cable Special Use Permit (Oregon Telephone)	Approximately 8 miles of buried phone cable from Bates to Blue Mt. Summit. The buried cable is located just north of Highway 26, with right-of-way in the Dad's Creek Subwatershed (T 12 S. R34 E. Sections 10, 15, and 16).
1970's until present	Winter Recreation Snowmobiling	Grooming and use of snowmobile trails.
1950's until present	Fire Suppression	Fire suppression activities and rehabilitation.
Early to mid 1990's	Road Closures	The Genesis New Perspectives Demonstration Project obliterated 4.3 miles of existing native surface road, closed 8.3 miles of road yearlong, and seasonally closed 19.3 miles of road during the winter range use period.
1995 to present	Fiber Optics Cable Special Use Permit (Oregon Telephone)	Approximately 8 miles of cable from Bates to Blue Mt. Summit. Buried cable is located just north of Highway 26 in the Dad's Creek Subwatershed in T. 12 S., R. 34 E. Sections 10, 15, and 16.
?	Fireside Water Supply Special Use Permit	Spring box is located in T. 12. S., R. 34 E. Section 10 (SE ¼ of the SW ¼). A buried plastic pipeline (approximately ½ mile in length) runs from the spring box to the Fireside Lodge located in Section 15 (N ½ of NW ¼).

Present or Ongoing Activities (2008)

Table C-7 Present Activities

Present Activity	Description
Summer, Fall, and Winter Recreation	Same as in past
Use and maintenance of National Forest Roads	Same as in past
Powerline/Buried Phone Cable Special Use Permits	Same as in past
Fire Suppression	Same as in past
Fireside Water Supply Special Use Permit	Same as in past
Mining	See past
Water Withdrawals/Irrigation	Same as in past
Firewood cutting	Same as in past
Invasive Weed Control	Ongoing identification of weed sites and treatment by pulling and grubbing.

Livestock grazing	Grazing on Dixie, Upper Middle Fork, and Reynolds grazing allotments is currently permitted in the analysis area. The Sullens Allotment was closed to livestock grazing following a NEPA decision in 2007. Dixie Allotment 173 cow-calf pairs from 06/01 to 10/15 (1028 animal unit months: AUMs). Includes approximately 16,674 acres of National Forest lands and 26,720 total acres Upper Middle Fork Allotment 485 cow-calf pairs from 06/01 to 10/15 (2883 animal unit months: AUMs). Includes approximately 54,923 total acres, all National Forest lands Reynolds Creek Allotment 166 cow-calf pairs from 06/01 to 09/18 (792 animal unit months: AUMs). Includes approximately 21,288 acres of National Forest lands and 24,028 total acres

Foreseeable Activities

Table C-8 Forseeable Activities

Year	Approved	Foreseeable Activity	Description
Annual	Yes	Mining	Same as in the past
Annual	Yes	Water Withdrawals/Irrigation	Same as in the past
Annual	Yes	Firewood cutting	Same as in the past
Annual	Yes	Grazing	Same as ongoing
Annual	Yes	Invasive Weed Control	Same as in past
Annual	Yes	Summer, Fall, and Winter Recreation	Same as in past
Annual	Yes	Use and maintenance of National Forest Roads	Same as in past
Annual	Yes	Powerline Special Use permits (Idaho Power and OTEC).	Same as in past
Annual	Yes	Fire Suppression	Same as in the past

Annual	Yes	Oregon Telephone Fiber Optics and Telephone Cable Special Use Permit	Same as in the past
Annual	Yes	Fire Suppression	Same as in the past
Annual	Yes	Fireside Water Supply Special Use Permit	Same as in the past
2008	Pending	Sumpter Valley Interpretive Site Project	Contruction of a new parking pull-out along U.S. Highway 26. Construction of approximately ¼ mile of trail to link new pull-out to existing features.
2008 or 2009	Pending	Dad's Creek Ditch Diversion Improvement	Construction of lay flat diversion structures and fish screens for diversion on Dad's Creek . These structures would eliminate the trapping of fish within the ditches and improve fish passage.

Appendix D – Collaboration Comments

This appendix contains the Blue Mountain Forest Partners collaboration group recommendations to the Forest Service.

Document 1 – Initial Recommendations

Draft criteria for Forest Service consideration in preparing Dad's Creek Project Final Version, February 21, 2007

This memo is intended to provide assistance from the Grant County collaboration group to the Forest Service to help them prepare a proposed action for the Dad's Creek Project.

The collaborative group met on February 21, 2007 and agreed with full consensus on all aspects of this memo with the understanding that this represents an iterative approach to project planning and ongoing discussions will further refine activities recommended for this project.

Geographic scope

The geographic scope of the project should be the Dad's Creek subwatershed. Not all of the subwatershed will be subject to silvicultural or other types of treatments. Some areas may be inappropriate for treatment due to cost, technical feasibility and/or resource concerns or needs. It is our intention that this be a restoration project that integrates community needs and ecological objectives.

Goals

The overall goal of the project is to establish a healthy native forest ecosystem based on an assessment of historical conditions and current understanding of forest ecology in this climate zone and forest type. We anticipate that achieving this goal will require a long-term commitment to the area.

Our recommended specific goals of the project are:

1. Moderate fire behavior in forests that were historically adapted to frequent fire, but are now at risk of uncharacteristic severe fire, and that are in proximity to private lands (particularly those within the Wildland Urban Interface). Forests should be treated to be more resilient in the face of disturbance.
2. Restore, maintain or establish diverse, dynamic, and complex forest structure and composition that supports high levels of historic or desired biodiversity. The Forest Service should enhance old-growth characteristics, and maintain trees of all species that have old growth or fire resistant characteristics.

3. Enhance hardwoods, especially riparian hardwoods.
4. Enhance aquatic conditions for cold-water species.
5. To the extent possible, implement a cost effective project that explores a range of funding options and generates as much revenue as it spends, or better yet, generates net income that can be devoted to other restoration projects.
6. Provide raw materials to local facilities and employment for the local workforce.

Issues

In its environmental analysis, we would like the Forest Service to:

1. Address opportunities to protect and enhance soil and aquatic resources, minimizing adverse disturbance and protecting and improving water quality and soil productivity. Protecting and enhancing soil and aquatic resources is expected to lead to better conditions for trout, steelhead and other sensitive fish species. Opportunities for pro-active stream restoration should also be considered.
2. Address opportunities to enhance local economics, including labor force retention and development, and the local necessity for a sustainable flow of wood fiber and other resources from the national forest.
3. Consider opportunities to stabilize the existing road system and improve fish passage. Silvicultural treatments should be designed so that no new system road construction is required, unless necessary to improve protection to the forest ecosystem inclusive of soil, water, fish and wildlife. The Forest Service should strive for lower open road densities after forest management treatments are complete.
4. Consider effects to interior forest dependent/associated species and address opportunities to protect and improve habitat for rare, sensitive, threatened or endangered species, as well as other resident native species.
5. Address opportunities to treat invasive exotic plants and enhance native vegetation. Consider the availability and opportunity to use local, native grass and forbs for revegetation.
6. Consider historic vegetative conditions and how silvicultural treatments will impact historic, current and desired vegetation communities. Place all proposed actions in the context of the natural, cultural and socio-economic landscape. Design treatments to enhance broader landscape ecology.
7. Address the spread of mistletoe and other pathogens while maintaining the positive ecological roles of forest pathogens.
8. Consider how proposed treatments conform to forest plan standards and guidelines, land allocations and forest plan direction (as amended by eastside screens).
9. Address needed restoration tasks in the area, and consider how stewardship authority can be used to complete these tasks.
10. Consider collaboration with the BLM on treatments in their inholdings, as well as outreach and cooperation with tribes and other interest groups, including private landowners.
11. Create conditions suitable to implement a broadcast underburning and other prescribed fire program on the landscape.
12. Consider and fully disclose the consequences of failing to treat forests in the area.

Information needs
The collaborative group would like to review Forest Service materials that describe:

1. Historic and existing vegetation communities (overstory and understory species). The FS should determine whether existing plant association descriptions accurately identify seral stage and potential ungulate forage production.
2. Location of unique habitats (e.g. aspen, wetlands, springs, talus, caves and cliffs) and known sensitive species locations.
3. Big game use of the area.
4. Landscape management allocations in the proposed project area, and general status/condition/allocation of adjoining and proximate private lands.
5. Summary description of active grazing allotments, if any, in the area.
6. Existence of steep and/or unstable slopes.
7. Any other information about erosion potential, including soil compaction and effective ground cover.
8. Stream surveys (habitat and species information) and stream flow (yield, duration, timing) if available.
9. Data and maps that describe 303(d) listed streams.
10. Maps of WUI/CWPP boundaries.
11. Locations of invasive exotic plants.
12. Road system maps, including fish passage barriers, and ancillary data such as open road densities related to big game security cover.
13. Information—including a description of the scope and objectives—about any past, present or planned monitoring efforts.
14. Relevant information about potential cumulative effects.
15. Relevant information about cultural or archaeological sites.
16. Applicable scientific research on ecological restoration that addresses
    a. wildlife, aquatic, and botanical species of concern;
    b. forest ecological and wildlife habitat, water quality, and soils issues.
17. Applicable restoration methods, mitigation measures, recommendations, and concerns, including the type and range of machinery and equipment available (including that which may not yet be available in the region).
18. The full range of ecologically-sound options/methods for reducing the presence and spread of invasive exotic plants in the project area, including full disclosures of the impacts of methods, toxicity, and potential harms of any formulations considered for use.

Some of this information, may, in part, be available at this time, and the group would like to review it, if it is available in a concise and accessible format. If the information is not currently available, the information should be developed as part of the planning process and made available to the group when completed.

Thank you for considering these comments, we appreciate the Forest Service's willingness to work with the community, and look forward to our collaboration on the Dad's Creek project.

Document 2 – Follow Up Recommendations

Blue Mountains Forest Partners
Dad's Creek Recommendations
October 25, 2007

[The potential treatments we have from the Forest Service will be adjusted and revised according to data gathered along the way, including bird surveys, etc. Prescriptions and locations aren't set in stone. Specialists' reports will be complete mid-February so most specialist information will be available by then with the exception of the goshawk surveys and neotropical bird work. Question remains about presence of Columbia spotted frog.]

Commercial thinning, precommercial thinning and understory removal in northwest portion of project area are agreeable.

Riparian areas/ stream restoration
Group recommends looking at more opportunities to do stream and riparian restoration as part of this project. Goals would be to restore water quality (including temperature) and fish habitat. Growing big wood for later structure for streams and supporting or restoring hardwoods should also be considered.

More background/ discussion: Stream along Unit 188 has some good riparian hardwoods, but there are breaks where cattle trails lead to stream that have compromised riparian area/vegetation, so few riparian plants are present. There is also a skid trail leading to the creek. Potential to look at minimizing grazing impacts on the stream.

Convert to seral/ HRS/ regeneration units

Unit 70: Group recommends no treatment and Eric concurs.

More background/ discussion: unit 70 is relatively moist and wet.

Unit 78: Group recommends that FS incorporate pine-dominated/ drier areas of unit 78 for treatment. North and east sides (looking at map north and east, not north and east aspects) of 78 should be included for treatment.

More background/ discussion: borderline of warm dry and moist areas/ transition zone. Unit is at about 5,800 feet in elevation; mixed conifer old growth; lots of wildlife use. Conflict over protecting pileated habitat and creating habitat for whiteheaded woodpeckers was resolved by adhering to the prescription described above.

Unit 120: Group recommends that FS thin up to 15" with a preference for mistletoe removal. Preference to doug fir over grand fir. Consider prescribed fire.

More background/ discussion: west aspect seems more pine dominant. North aspect more mixed conifer/ doug fir dominant. Transition zone; active pileated use; steep slope. P pine stumps – has reverted to doug fir. Area may be a good choice for the creation of more whiteheaded woodpecker habitat because of the historic pines in the stand.

Brown units in southern portion/ lower elevation HUR units
Group recommends that the FS implement these prescriptions/ treatments except where aspect and moisture make a site more naturally mixed conifer. Larch should be retained (understand FS already intends to retain larch). If a good whiteheaded potential site exists, it should be restored to whiteheaded habitat. Group recommends that work be done gradually instead of all at once; enough trees should be left for mortality along the way.

More background/ discussion: some big pockets of grand fir on n and nw slopes and in hollows or flat spots. Heavy pileated use, especially in unit 192; retain cover. Pileated habitat also found abundantly in ridge to the ne of the project area. Some high quality old growth buried in the center of this 192 unit with spindly stuff around it. N and nw units look like they are more naturally doug fir (like unit 220). Unit 264 looks like it has never been logged before and has very little pine in it. It was suggested this unit be dropped but that was consensed on; it's surrounded by clear cuts.

[HUR units are about 5% of the 19% of og multi-strata present in planning area. There is currently no og single strata. The FS proposal aims to defragment areas and leave og where possible while also creating a burn block. FS is trying to connect DOG with habitat to the northeast and treat the area that borders private land.] One view of this proposal is that brown units and pink units are the best habitat so this calls into question the de-fragmentation goal. Another view was to take risks here like Steve Zack encouraged us to do to restore bird habitat like for the whiteheaded woodpecker.

High elevation mixed conifer/ most northern units

Unit 62: Group recommends this unit be dropped.

More background/ discussion: steep slopes in draw, historically fire maintained savanna. Lots of ladder fuels.

Unit 64: Group recommends thinning grand fir thickets.

Unit 66: Group recommends pre-commercial thinning the top of the unit as it is relatively open already and implementing more intensive treatments as the stand transitions to higher densities lower down.

DOG and ROG
Group recommends treatments in the DOG to help restore these stands or keep them going longer. Recommended treatments include light thinning and ladder fuel reduction around large trees. Another example the group supported was taking an 18" grand fir next to a large p pine to make the stand/ old growth more resilient. Group recommends a field trip be taken to sites in the DOG. Prescribed fire should be considered wherever possible.

More background/ discussion:

Unit 210: Good old growth character and diversity. This unit has great cover but it is at risk. There are some big scattered and clumped p pine and a few big doug fir and grand fir. Choked with medium size grand fir now. Spots in here where it would make sense to thin, spots where it would make sense to thin just around larger trees in the units. Prescriptions could be varied within the unit. Where we can leave places unlogged, great BUT also place a treatment in here if at all possible because otherwise we're going to lose these big trees. This unit is a possibility for the creation of whiteheaded habitat.

Extent of prescribed fire
Group is supportive of prescribed fire and recommends more fires as detailed in the DOG section and other sections in this document. In addition, the group recommends prescribed fire as possible in the white areas on the map between treatment areas in the far west of the project area.

More background/ discussion: the group would like to continue to work with the Forest Service on burn plans as they are developed, particularly as it relates to the choice of spring or fall burns.

Soil compaction
Group recommends preventing impacts where possible instead of mitigating impacts. For example, logging could be done in winter or over slash or with lighter-on-the-land equipment.

More background/ discussion: soil compaction seems like more significant issue in the southern portion of the project area.

Timeline
October 26: Dad's creek comments compiled and delivered to FS (Emily and Alden)
January 17: FS final proposed action and completed scoping
End of January: BMFP final response to FS proposed action
Feb 29: FS completes specialist reports
March 14: BMFP comments on specialists' reports to FS
March 30: BMFP feedback on draft document to FS

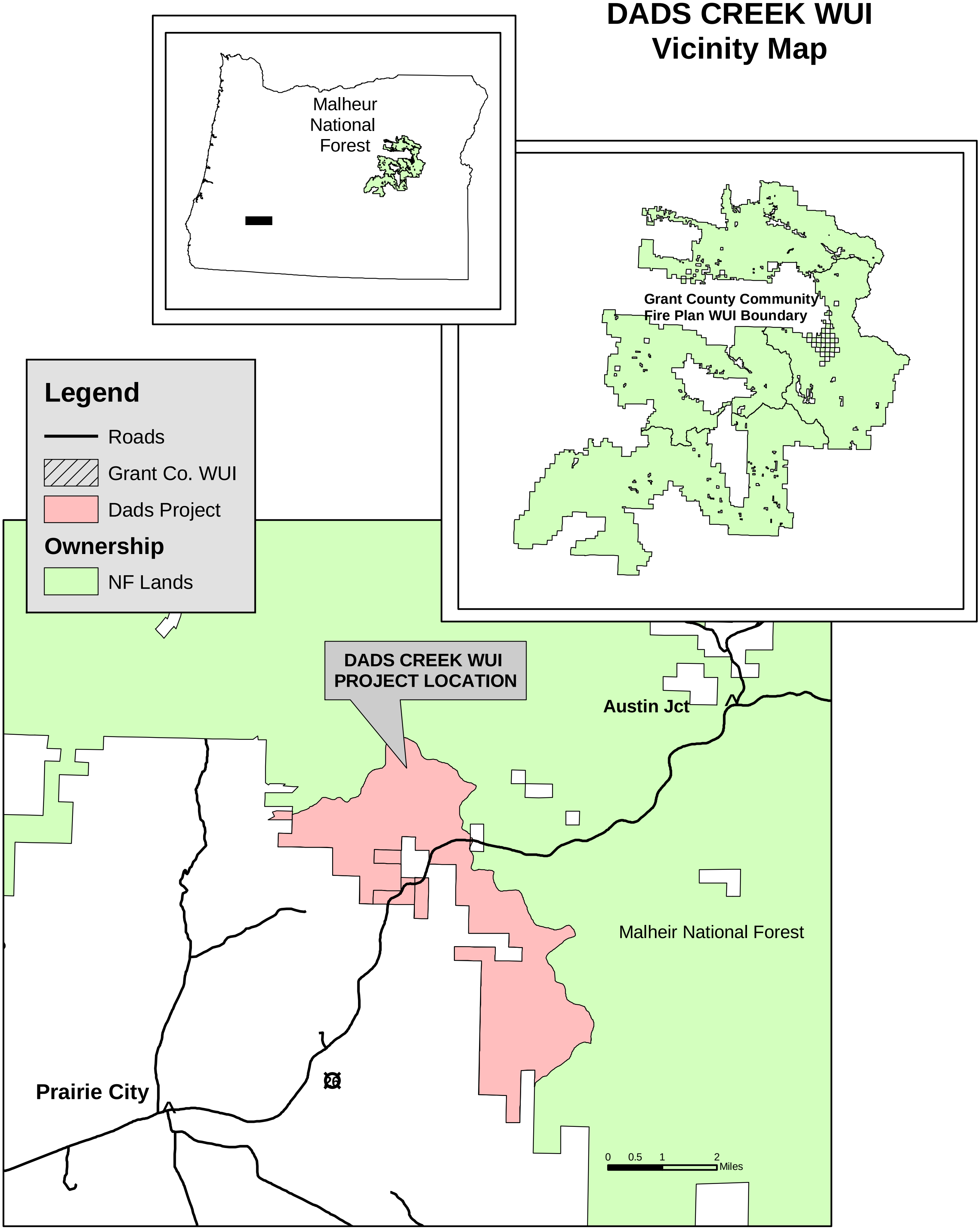
Between now and the next meeting, the BMFP would like to help the FS do outreach on a public meeting and also participate in a stream restoration field trip. Group members would also be interested in a trip to unit 210 - Irene will follow up with Eric on potential field trips.

Appendix E – Roads Analysis

The following tables display the results of the roads analysis that was done for the Dads Creek WUI Planning Area. There are currently 62.86 miles of roads in the planning area, of which 29.7 are open and 32.86 are closed. Haul of timber and biomass products are expected to happen on approximately 44 miles of these roads. All currently closed roads that would be opened for use are to be reclosed. Additionally, 1.4 miles of roads are to be closed for resource protection reasons.

Approximately 1.8 miles of temporary roads are planned to facilitate access during project implementation, which will be closed and rehabilitated after log and biomass haul is complete.

DADS CREEK WUI
Vicinity Map



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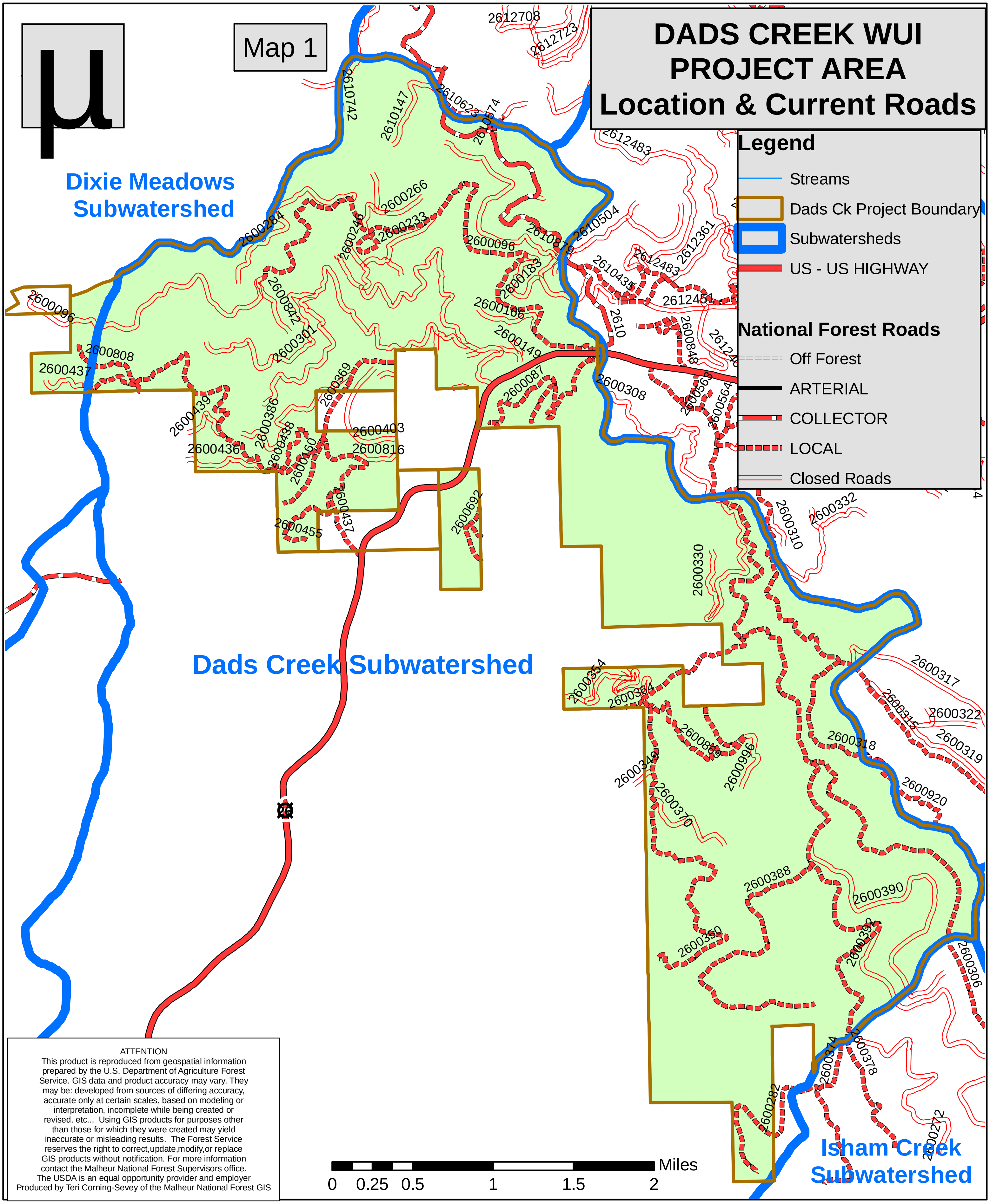
DADS CREEK WUI PROJECT AREA Location & Current Roads



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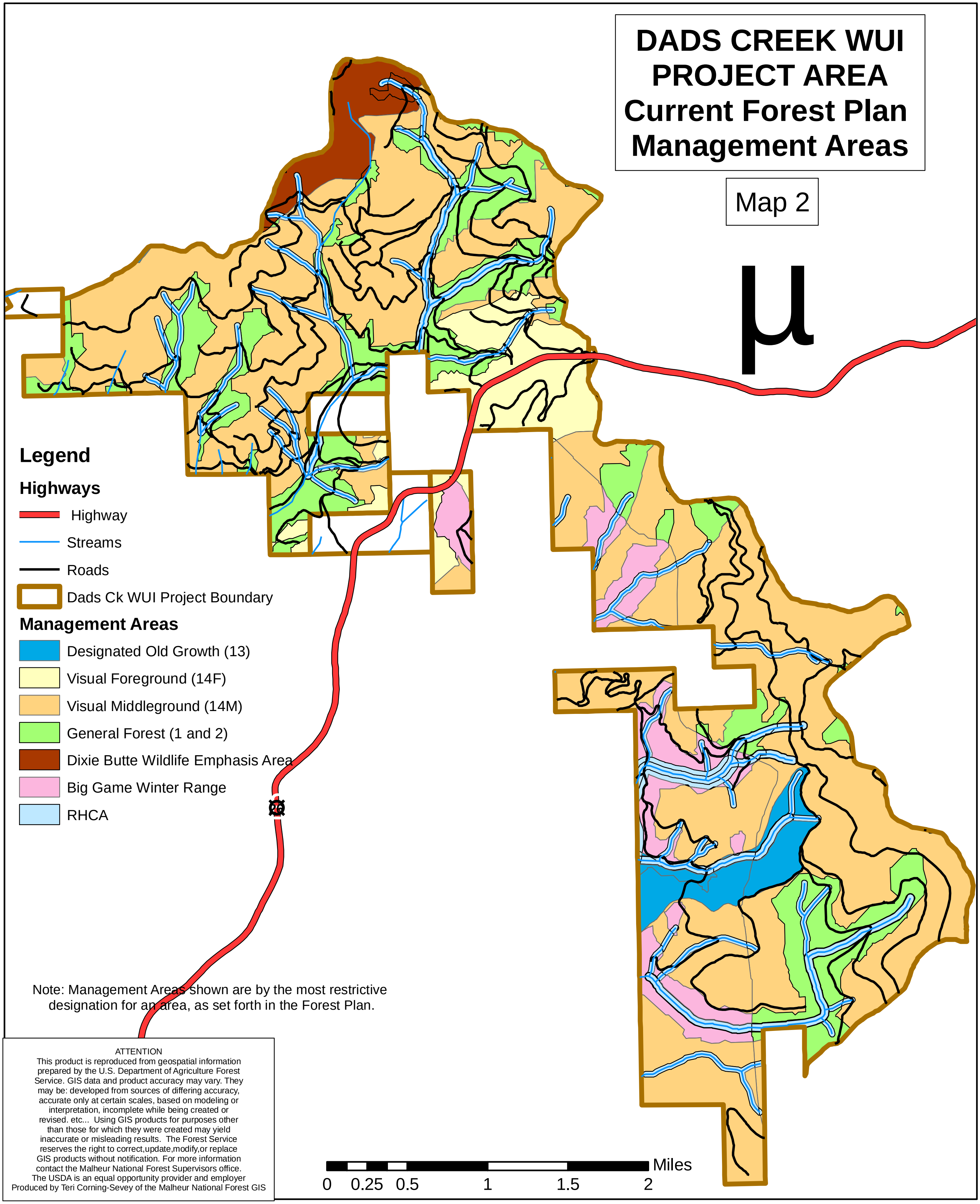
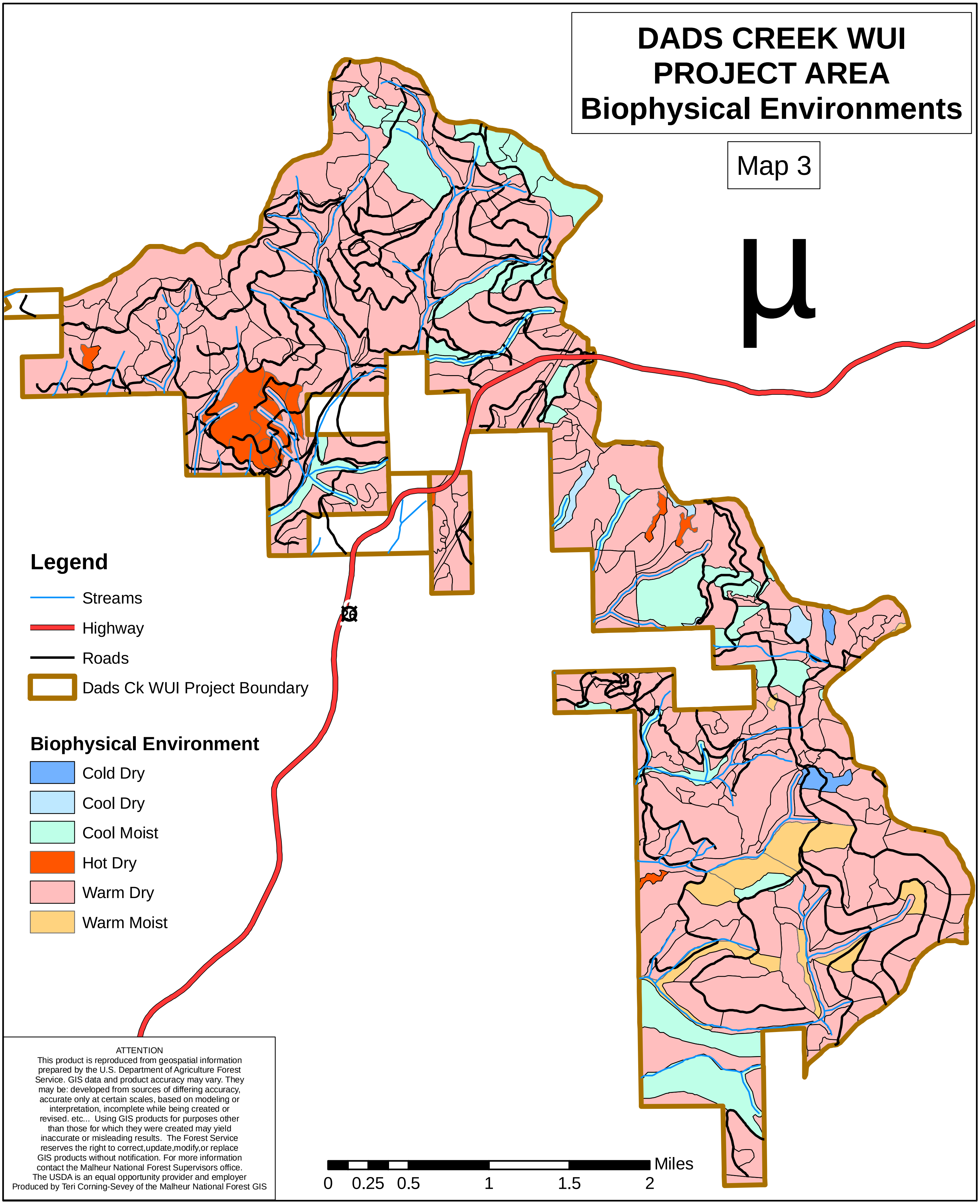

DADS CREEK WUI PROJECT AREA
Current Forest Plan Management Areas
Map 2
Legend
Highways
Highway
Streams
Roads
Dads Ck WUI Project Boundary
Management Areas
Designated Old Growth (13)
Visual Foreground (14F)
Visual Middleground (14M)
General Forest (1 and 2)
Dixie Butte Wildlife Emphasis Area
Big Game Winter Range
RHCA
Note: Management Areas shown are by the most restrictive designation for an area, as set forth in the Forest Plan.
0 0.25 0.5 1 1.5 2
Miles


DADS CREEK WUI
PROJECT AREA
Biophysical Environments
Map 3
Legend
Streams
Highway
Roads
Dads Ck WUI Project Boundary
Biophysical Environment
Cold Dry
Cool Dry
Cool Moist
Hot Dry
Warm Dry
Warm Moist
26
0 0.25 0.5 1 1.5 2 Miles
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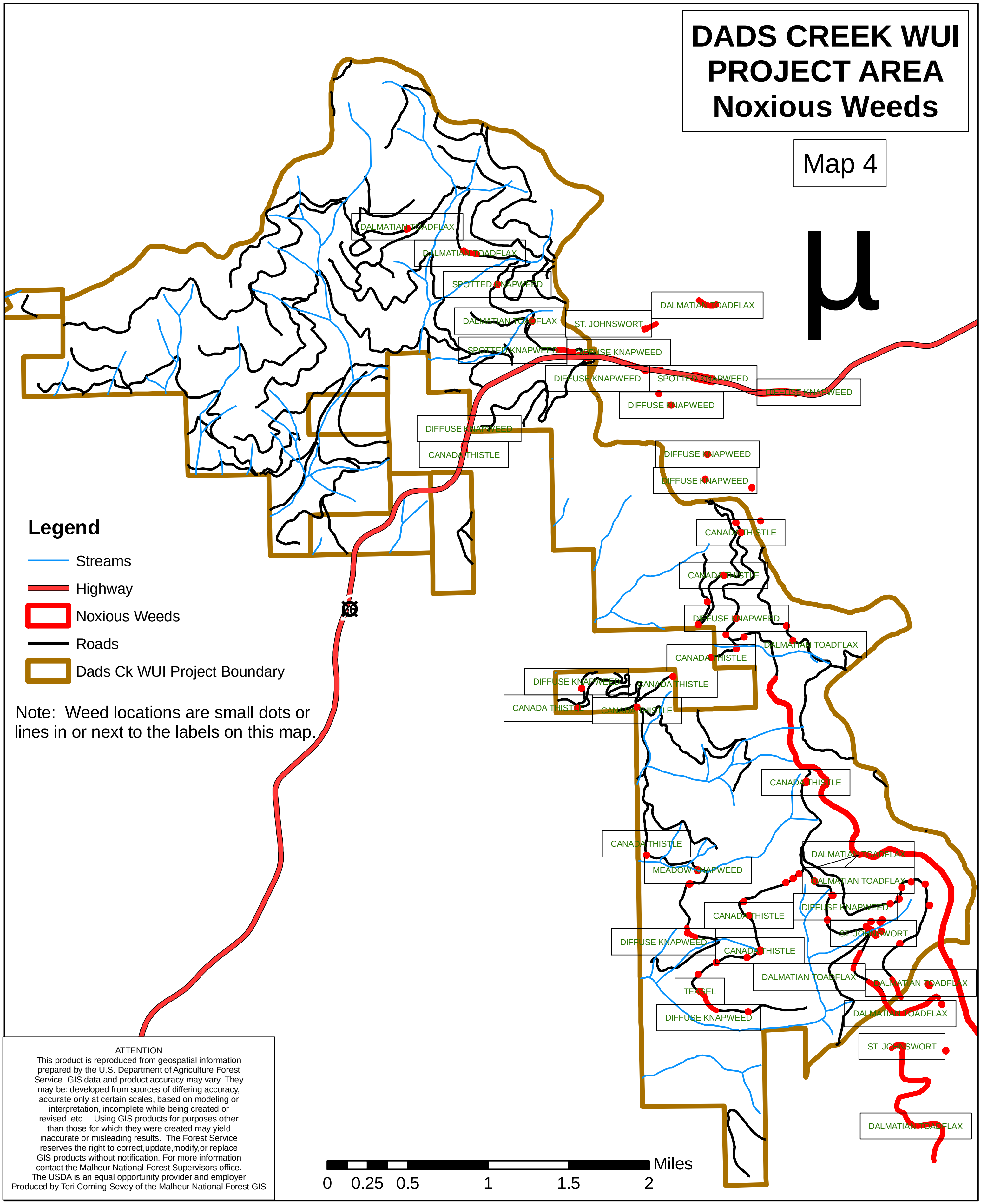
DADS CREEK WUI PROJECT AREA
Noxious Weeds

Map 4



Legend

- Streams
- Highway
- Noxious Weeds
- Roads
- Dads Ck WUI Project Boundary

Note: Weed locations are small dots or lines in or next to the labels on this map.

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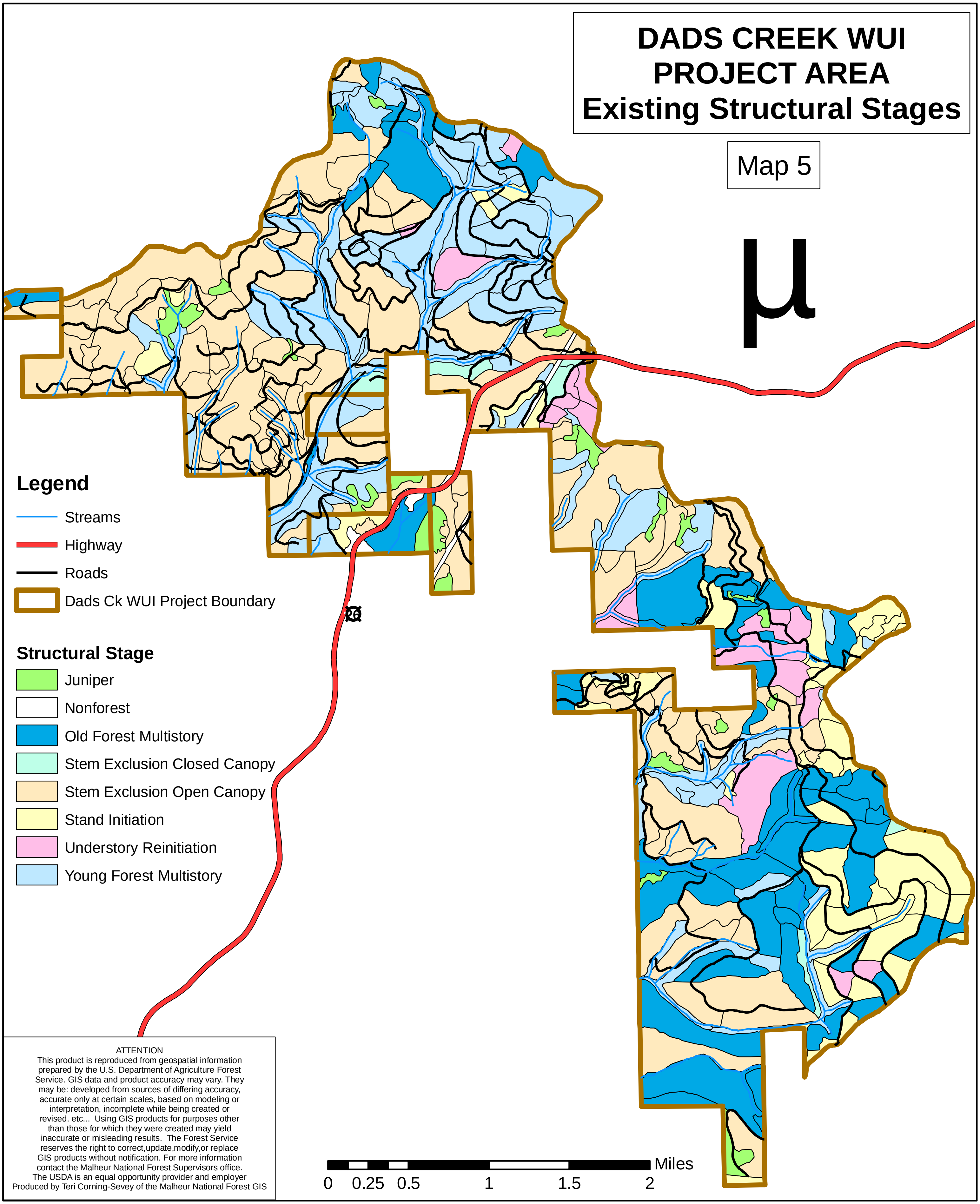
DADS CREEK WUI
PROJECT AREA
Existing Structural Stages
Map 5
Legend
Streams
Highway
Roads
Dads Ck WUI Project Boundary
Structural Stage
Juniper
Nonforest
Old Forest Multistory
Stem Exclusion Closed Canopy
Stem Exclusion Open Canopy
Stand Initiation
Understory Reinitiation
Young Forest Multistory
26
Miles
0 0.25 0.5 1 1.5 2
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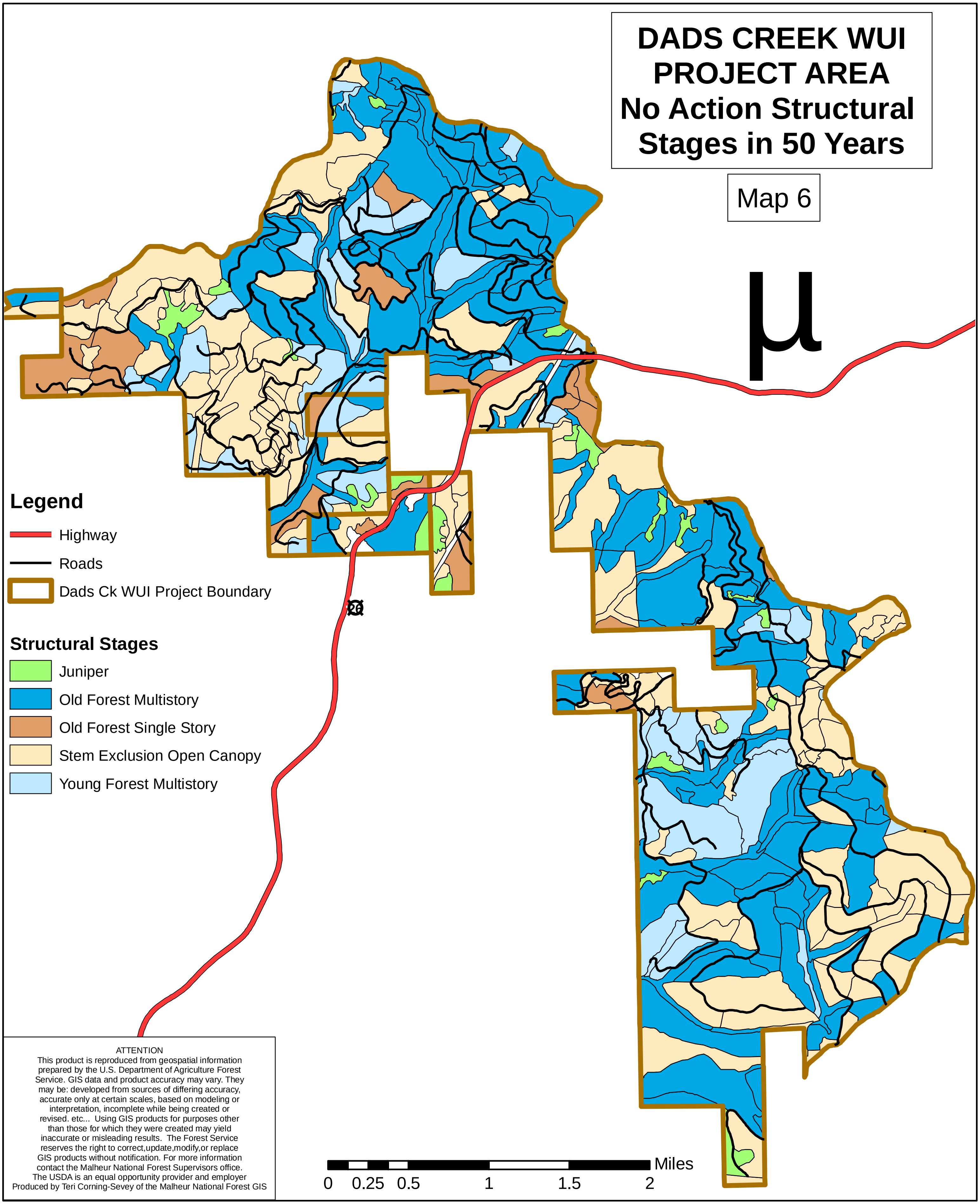
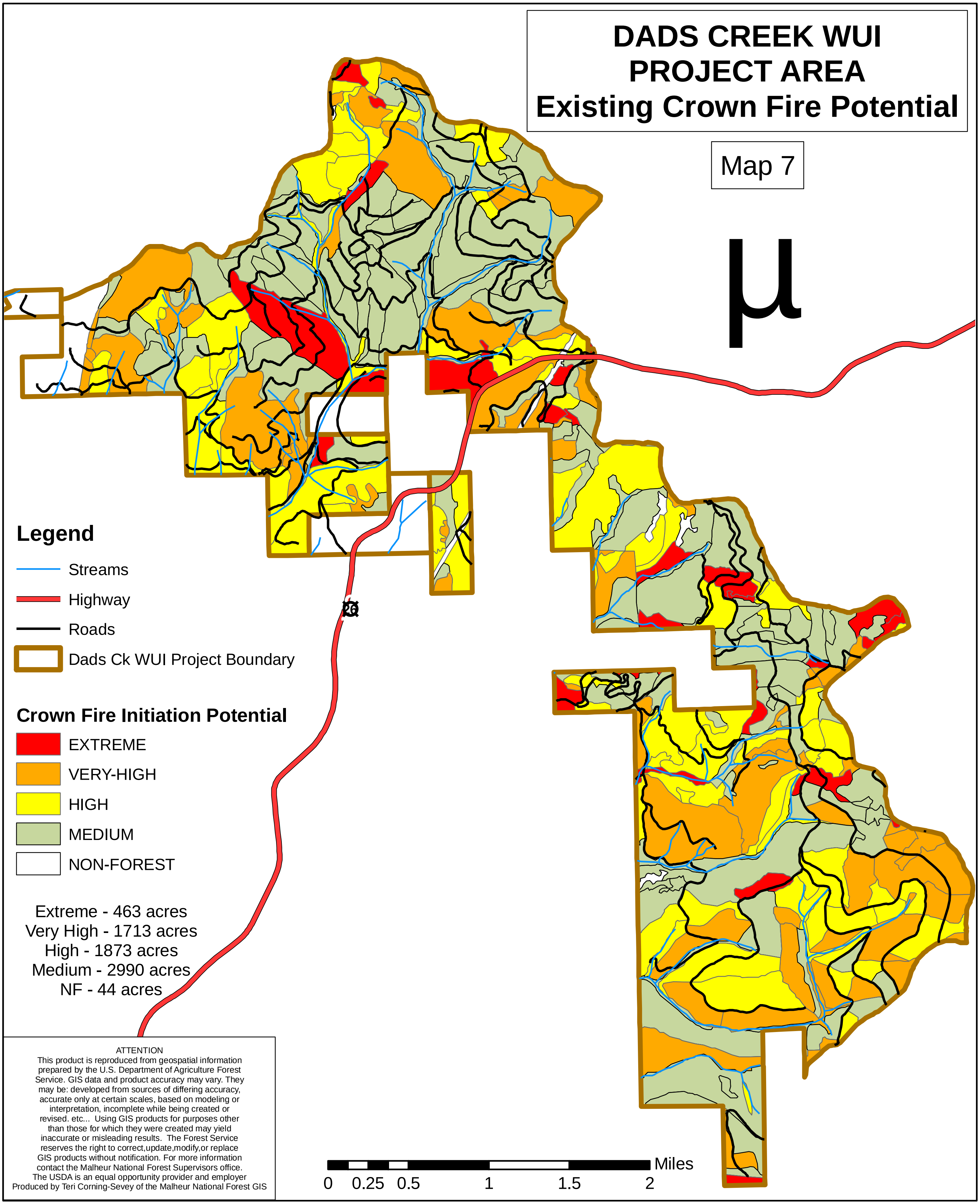
DADS CREEK WUI PROJECT AREA
No Action Structural Stages in 50 Years

Map 6




DADS CREEK WUI
PROJECT AREA
Existing Crown Fire Potential
Map 7
Legend
Streams
Highway
Roads
Dads Ck WUI Project Boundary
Crown Fire Initiation Potential
EXTREME
VERY-HIGH
HIGH
MEDIUM
NON-FOREST
Extreme - 463 acres
Very High - 1713 acres
High - 1873 acres
Medium - 2990 acres
NF - 44 acres
26
Miles
0 0.25 0.5 1 1.5 2
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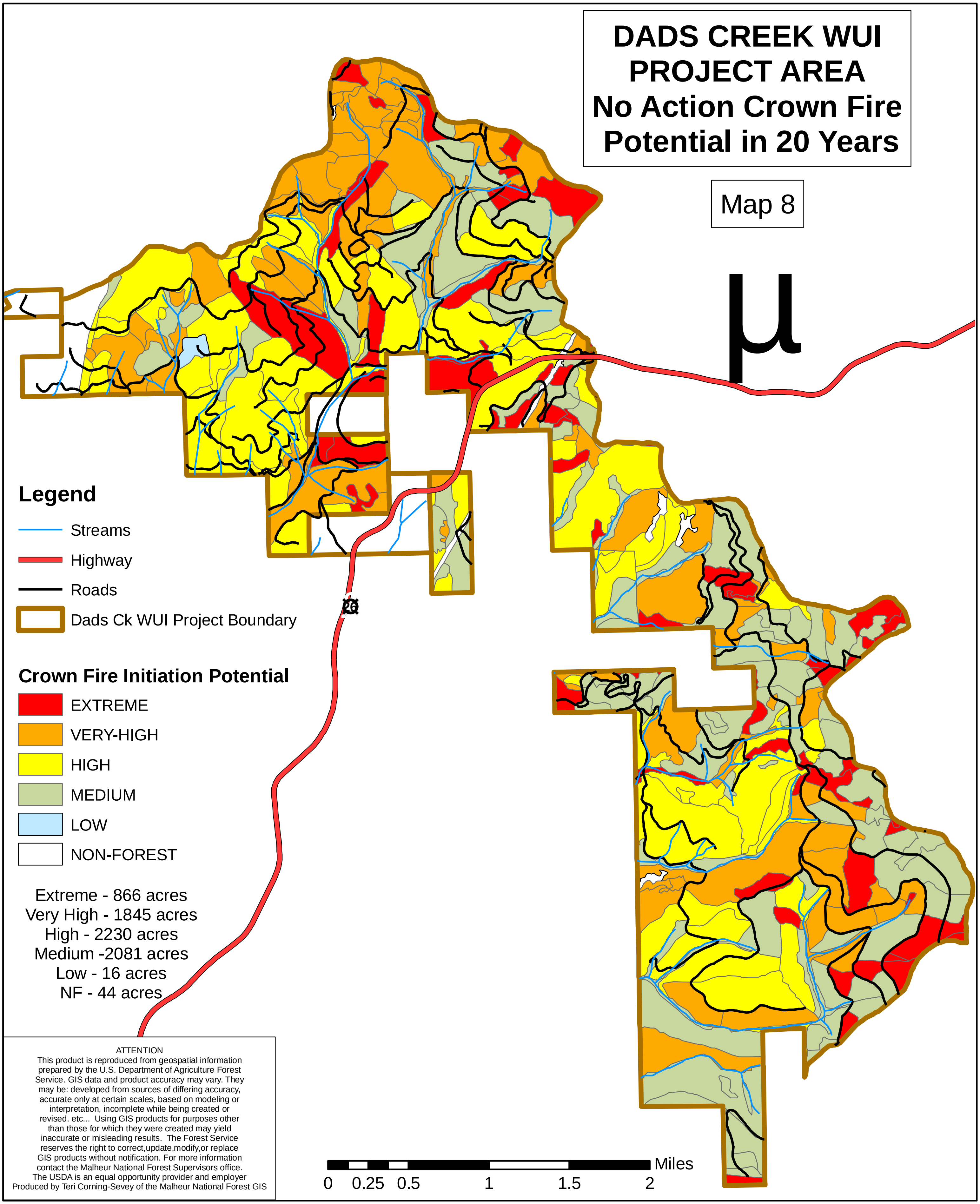
DADS CREEK WUI
PROJECT AREA
No Action Crown Fire
Potential in 20 Years
Map 8
Legend
Streams
Highway
Roads
Dads Ck WUI Project Boundary
Crown Fire Initiation Potential
EXTREME
VERY-HIGH
HIGH
MEDIUM
LOW
NON-FOREST
Extreme - 866 acres
Very High - 1845 acres
High - 2230 acres
Medium -2081 acres
Low - 16 acres
NF - 44 acres
26
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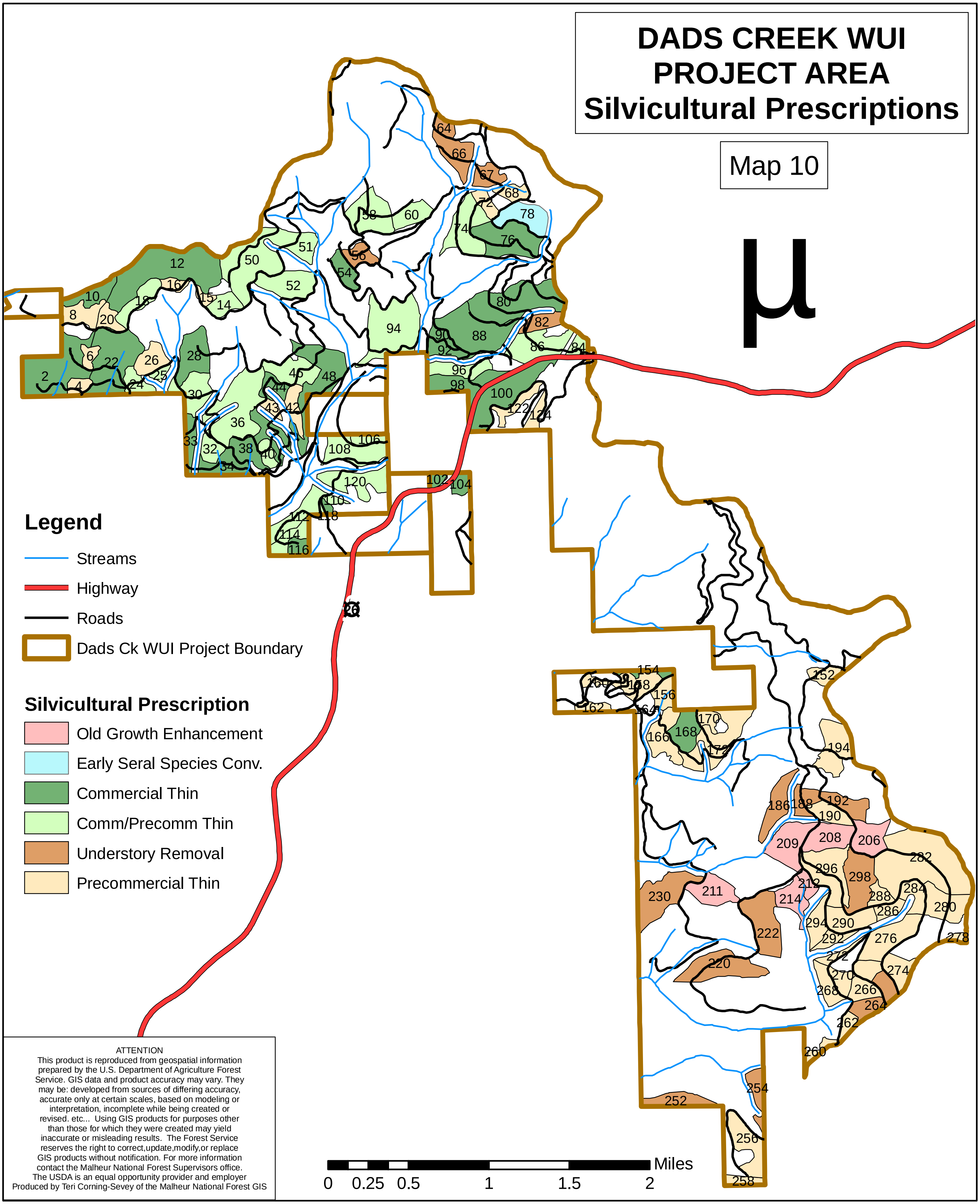
Miles
0
0.25
0.5
1
1.5
2


DADS CREEK WUI
PROJECT AREA
Silvicultural Prescriptions
Map 10
Legend
Streams
Highway
Roads
Dads Ck WUI Project Boundary
Silvicultural Prescription
Old Growth Enhancement
Early Seral Species Conv.
Commercial Thin
Comm/Precomm Thin
Understory Removal
Precommercial Thin
0 0.25 0.5 1 1.5 2 Miles
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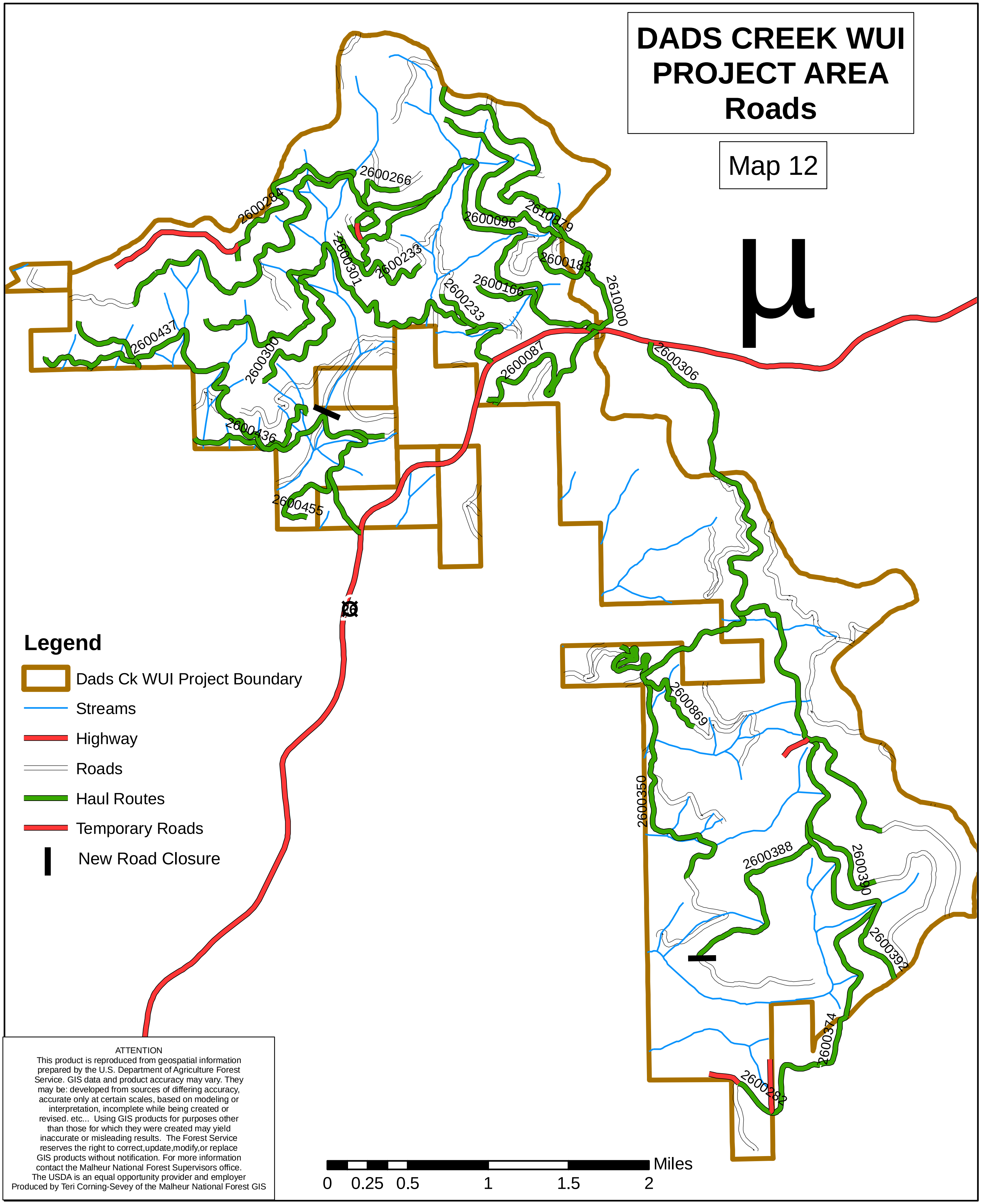
DADS CREEK WUI PROJECT AREA
Roads
Map 12
2600266
2600284
2600096
2610079
2600301
2600233
2600183
2600166
2610000
2600233
2600437
2600300
2600087
2600306
2600436
2600455
2600869
2600350
2600388
2600390
2600392
2600374
2600282
Legend
Dads Ck WUI Project Boundary
Streams
Highway
Roads
Haul Routes
Temporary Roads
New Road Closure
Miles
0 0.25 0.5 1 1.5 2
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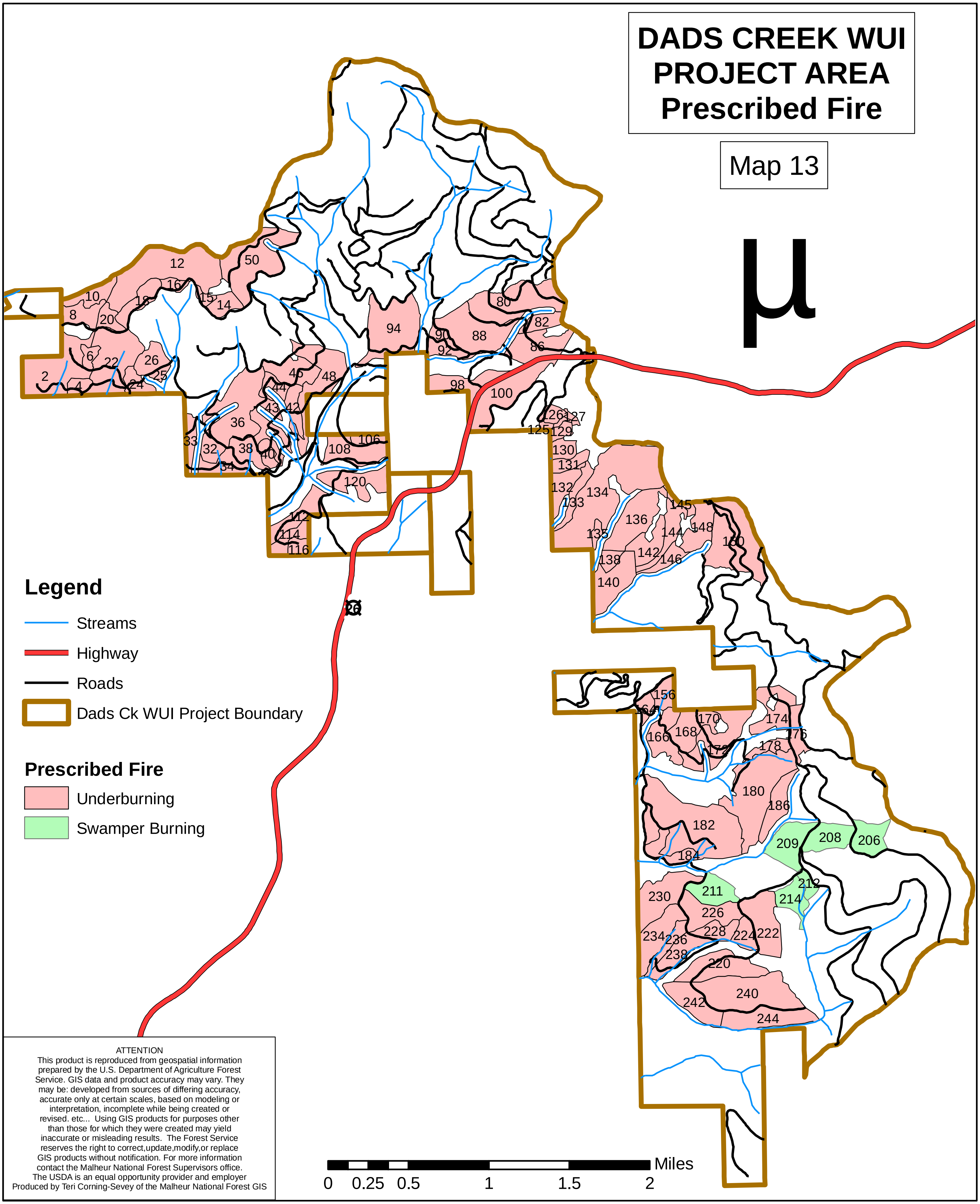
DADS CREEK WUI
PROJECT AREA
Prescribed Fire
Map 13
Legend
Streams
Highway
Roads
Dads Ck WUI Project Boundary
Prescribed Fire
Underburning
Swamper Burning
Miles
0 0.25 0.5 1 1.5 2
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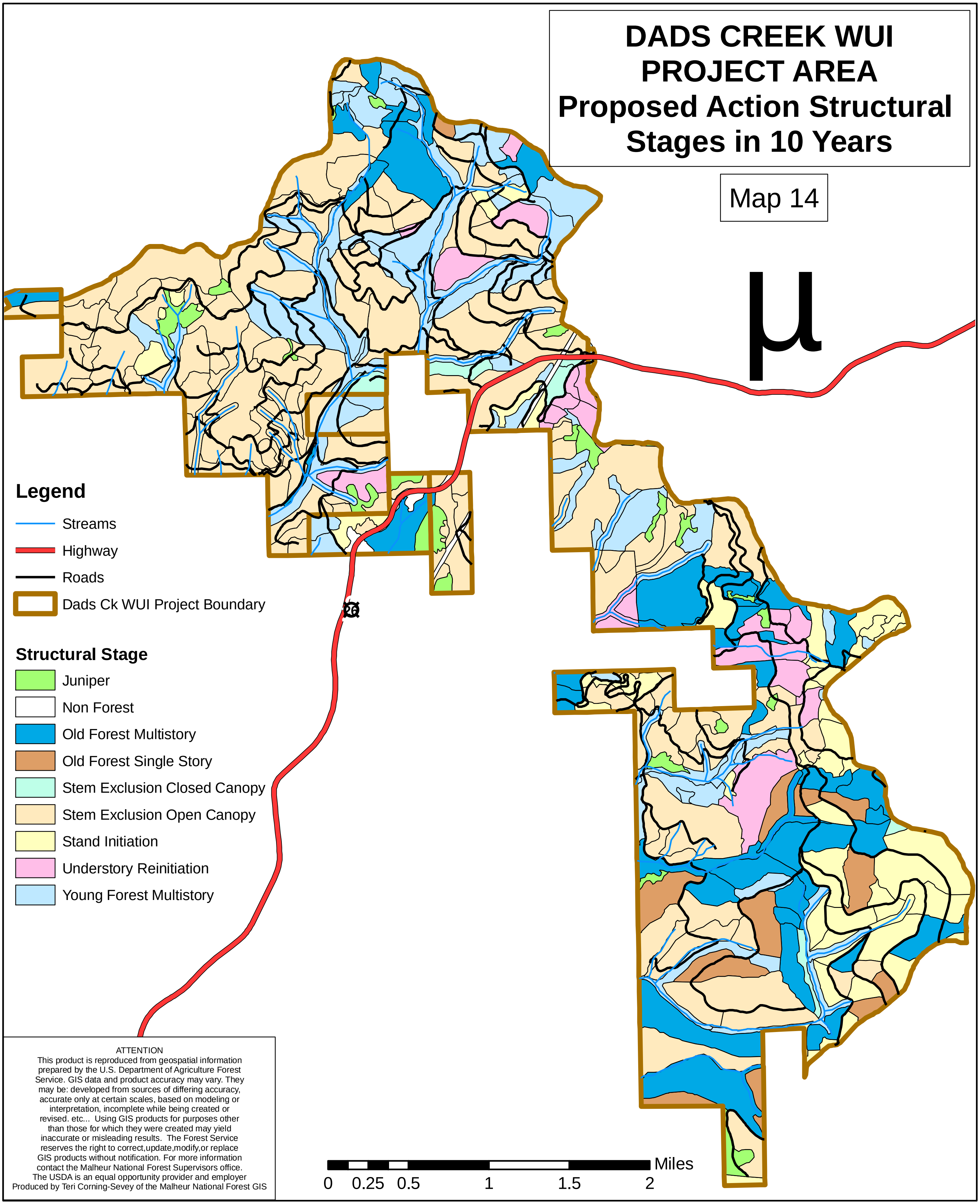

DADS CREEK WUI
PROJECT AREA
Proposed Action Structural
Stages in 10 Years
Map 14
Legend
Streams
Highway
Roads
Dads Ck WUI Project Boundary
Structural Stage
Juniper
Non Forest
Old Forest Multistory
Old Forest Single Story
Stem Exclusion Closed Canopy
Stem Exclusion Open Canopy
Stand Initiation
Understory Reinitiation
Young Forest Multistory
26
Miles
0 0.25 0.5 1 1.5 2
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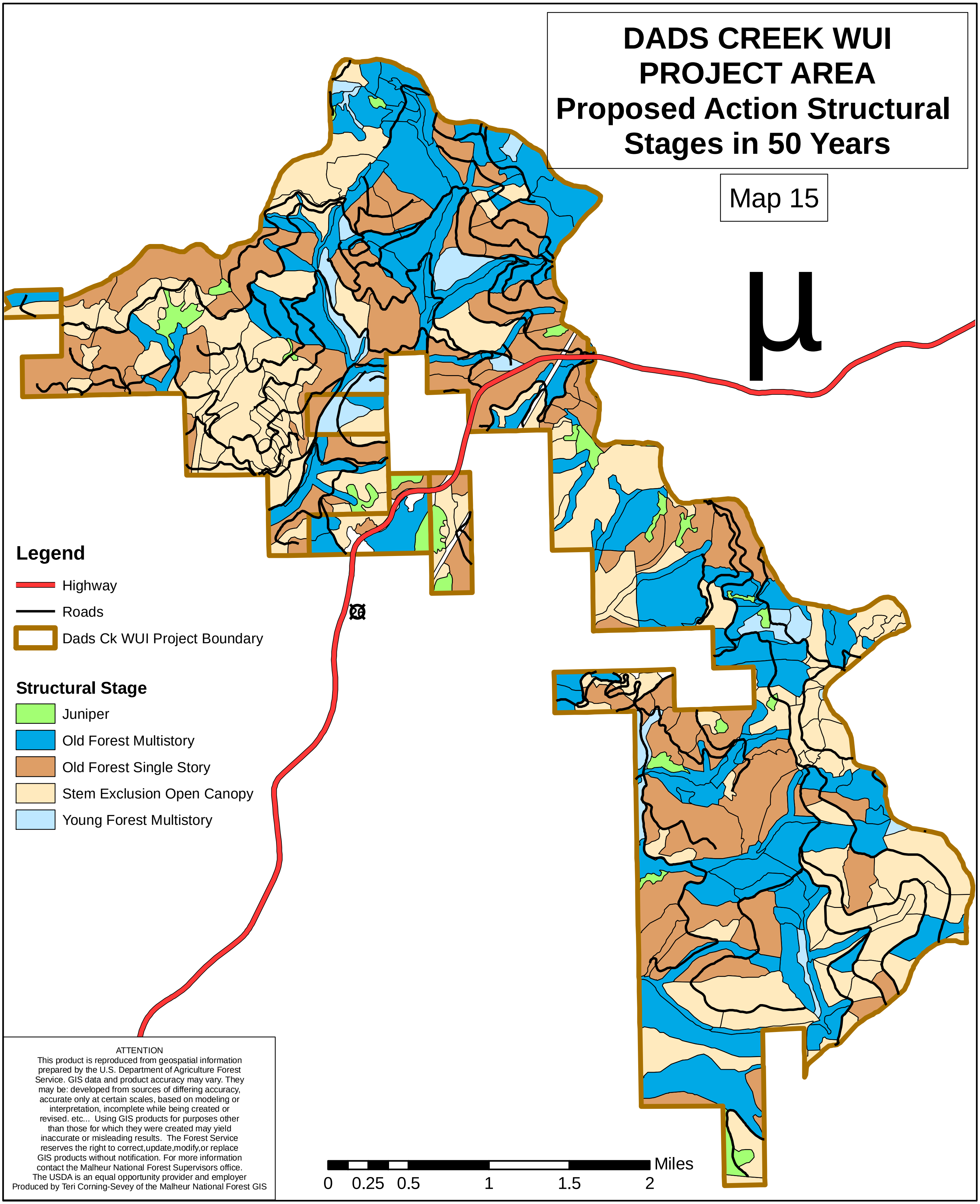
DADS CREEK WUI
PROJECT AREA
Proposed Action Structural
Stages in 50 Years
Map 15
Legend
Highway
Roads
Dads Ck WUI Project Boundary
Structural Stage
Juniper
Old Forest Multistory
Old Forest Single Story
Stem Exclusion Open Canopy
Young Forest Multistory
26
0
0.25
0.5
1
1.5
2
Miles
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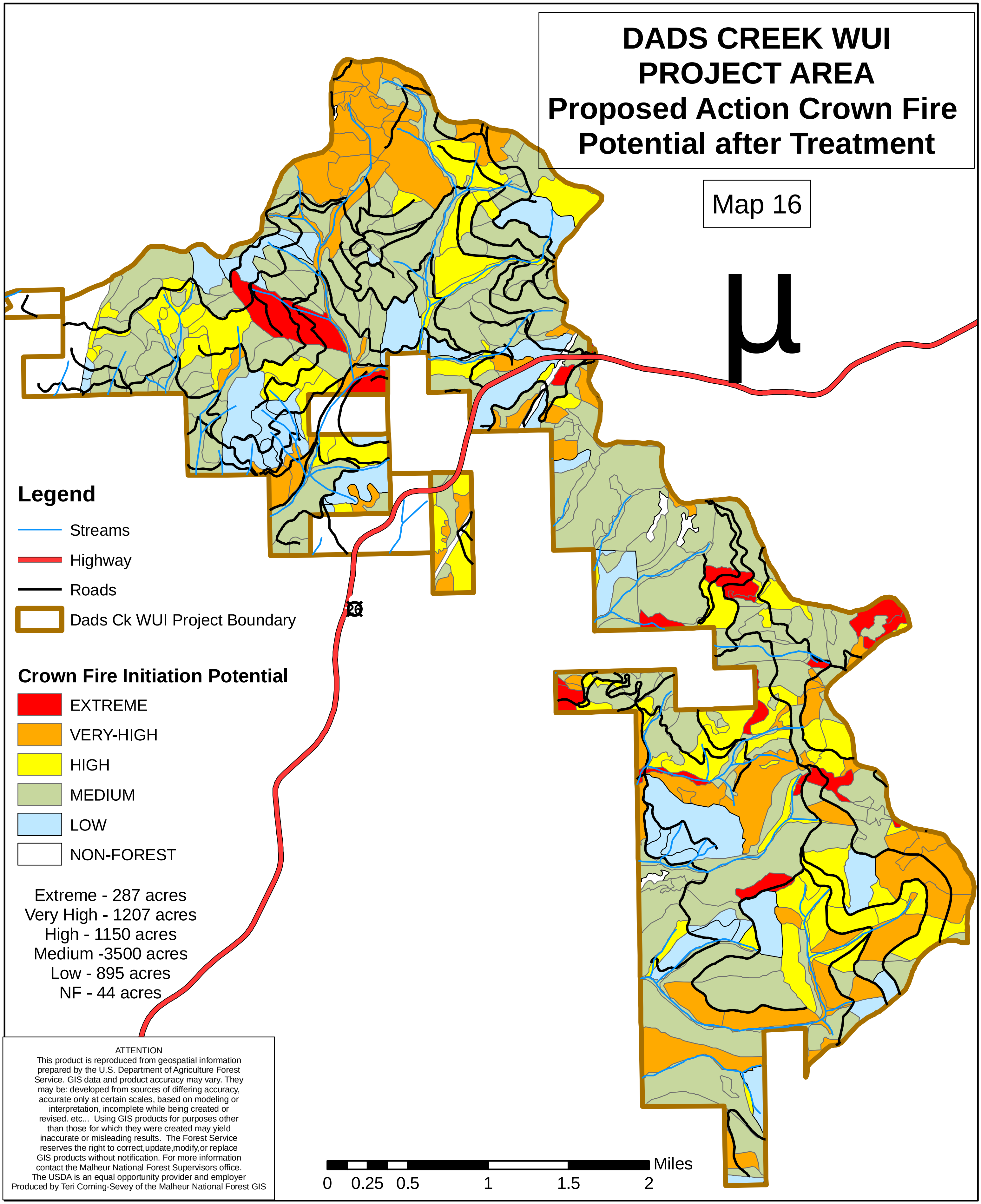
DADS CREEK WUI
PROJECT AREA
Proposed Action Crown Fire
Potential after Treatment
Map 16
µ
26
Legend
Streams
Highway
Roads
Dads Ck WUI Project Boundary
Crown Fire Initiation Potential
EXTREME
VERY-HIGH
HIGH
MEDIUM
LOW
NON-FOREST
Extreme - 287 acres
Very High - 1207 acres
High - 1150 acres
Medium -3500 acres
Low - 895 acres
NF - 44 acres
0 0.25 0.5 1 1.5 2 Miles
ATTENTION
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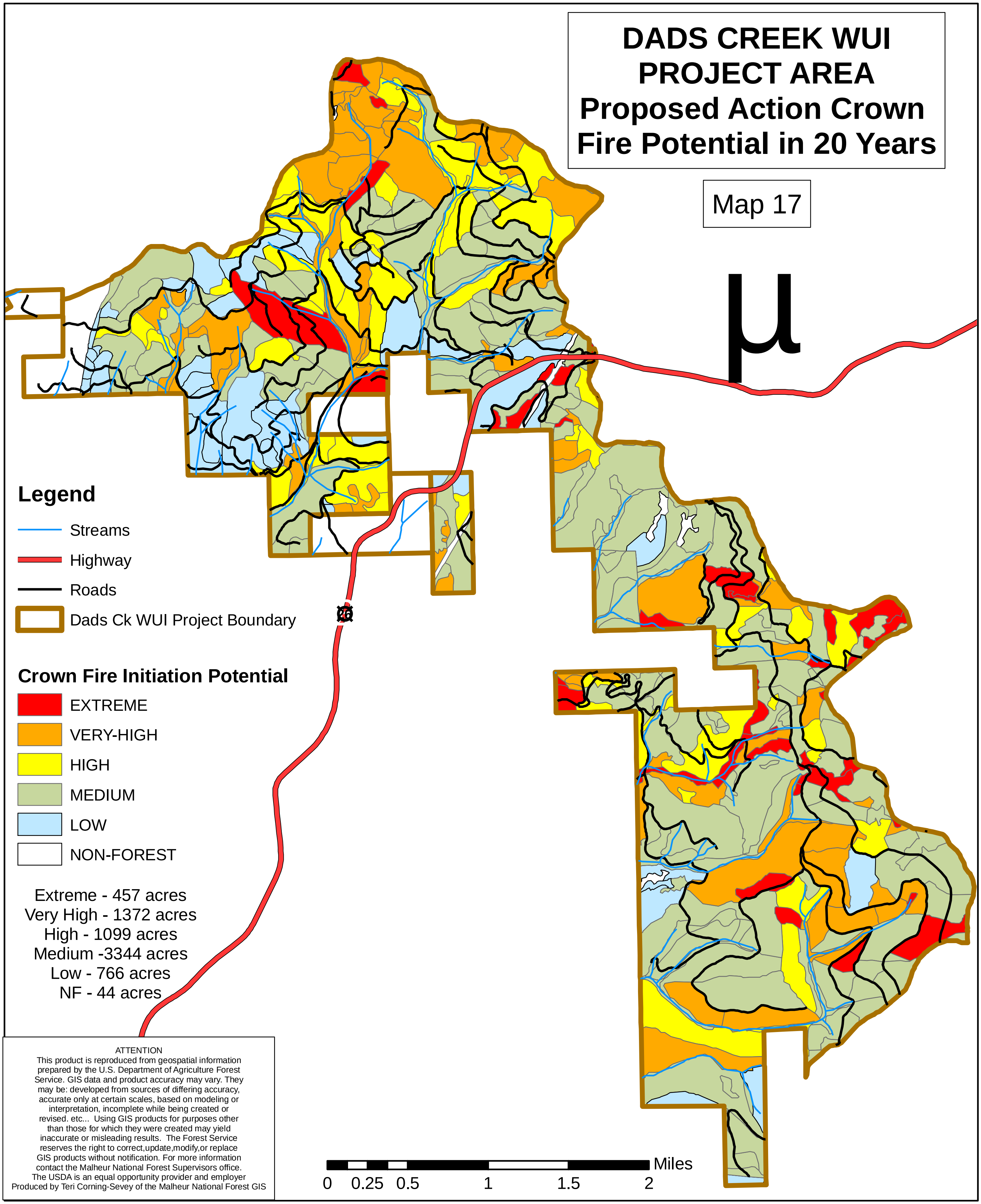
DADS CREEK WUI PROJECT AREA
Proposed Action Crown Fire Potential in 20 Years
Map 17
Legend
Streams
Highway
Roads
Dads Ck WUI Project Boundary
Crown Fire Initiation Potential
EXTREME
VERY-HIGH
HIGH
MEDIUM
LOW
NON-FOREST
Extreme - 457 acres
Very High - 1372 acres
High - 1099 acres
Medium -3344 acres
Low - 766 acres
NF - 44 acres
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Miles
0
0.25
0.5
1
1.5
2