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Environmental Assessment

East Wedge Project

Three Rivers Ranger District, Colville National Forest, Stevens County, Washington

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List of Acronyms

APE	Area of Potential Effect
BE	Biophysical Environment
BFWD	Back Full Width to Depth
BLM	Bureau of Land Management
BMP	Best Management Practice
CBZ	Canadian Border Zone
CCT	Colville Confederated Tribes
CFR	Code of Federal Regulations
CNF	Colville National Forest
CWD	Coarse Woody Debris
DAHP	Washington State Department of Archaeology and Historic Preservation

DBH	Diameter at Breast Height
DNR	Washington State Department of Natural Resources
DSD	Detrimental Soil Disturbance
EA	Environmental Assessment
EIS	Environmental Impact Statement
EW	East Wedge
FB	Fuel Break
FP	Forest Plan
FRCC	Fire Regime Condition Class
FS	Forest Service
FSM	Forest Service Manual
FWS	U.S. Fish and Wildlife Service
GIS	Geographic Information System
HRV	Historic Range of Variability
IDT	Interdisciplinary Team
INFISH	Inland Native Fisheries Strategy
IRA	Inventoried Roadless Area
LAU	Lynx Analysis Unit
LCAS	Lynx Conservation Assessment and Strategy
LFR	Ladder Fuel Treatment
LOS	Late and Old Structural Stage
LRMP	Colville National Forest Land and Resource Management Plan
LWD	Large Woody Debris
MA	Management Area (from Forest Plan)
MIS	Management Indicator Species
MOU	Memorandum of Understanding
MBF	Million Board Feet
MR	Management Requirement Area
MVUM	Motor Vehicle Use Map (Colville National Forest)
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NEWFC	Northeast Washington Forestry Coalition
NFMA	National Forest Management Act
NFS	National Forest System
NHPA	National Historic Preservation Act
NIZOG	North Idaho Zone Old Growth
NPV	Net Present Value
NRHP	National Register of Historic Places
OHV	Off-Highway Vehicle
OSHA	Occupational Safety and Health Administration
OSV	Over-Snow Vehicle
PA	Proposed Action
PCT	Precommercial Thinning
PF	Prescribed Fire
PLAC	Public Lands Advisory Committee
PNW	Pacific Northwest Region

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PPM	Pools per Mile
PWA	Potential Wilderness Area
RAWS	Lane Creek Remote Automated Weather Station
RHCA	Riparian Habitat Conservation Area
RMO	Riparian Management Objectives
ROW	Right-of-Way
Rx	Prescription
SADT	Seasonal Average Daily Traffic
SCCD	Stevens County Conservation District
SCCWPP	Stevens County Community Wildlife Protection Plan
SDI	Stand Density Index
SFB	Shaded Fuel Break
SOPA	Colville National Forest Schedule of Proposed Actions
TCMRA	Tri-Country Motorized Recreation Association
TCP	Traditional Cultural Property
TMDL	Total Maximum Daily Load
TS	Timber Sale
USDA	U.S. Department of Agriculture
USDI	U.S. Department of the Interior
USFS	U.S. Forest Service
VQO	Visual Quality Objective
WUI	Wildland Urban Interface

CHAPTER 1. PURPOSE AND NEED

PROJECT LOCATION

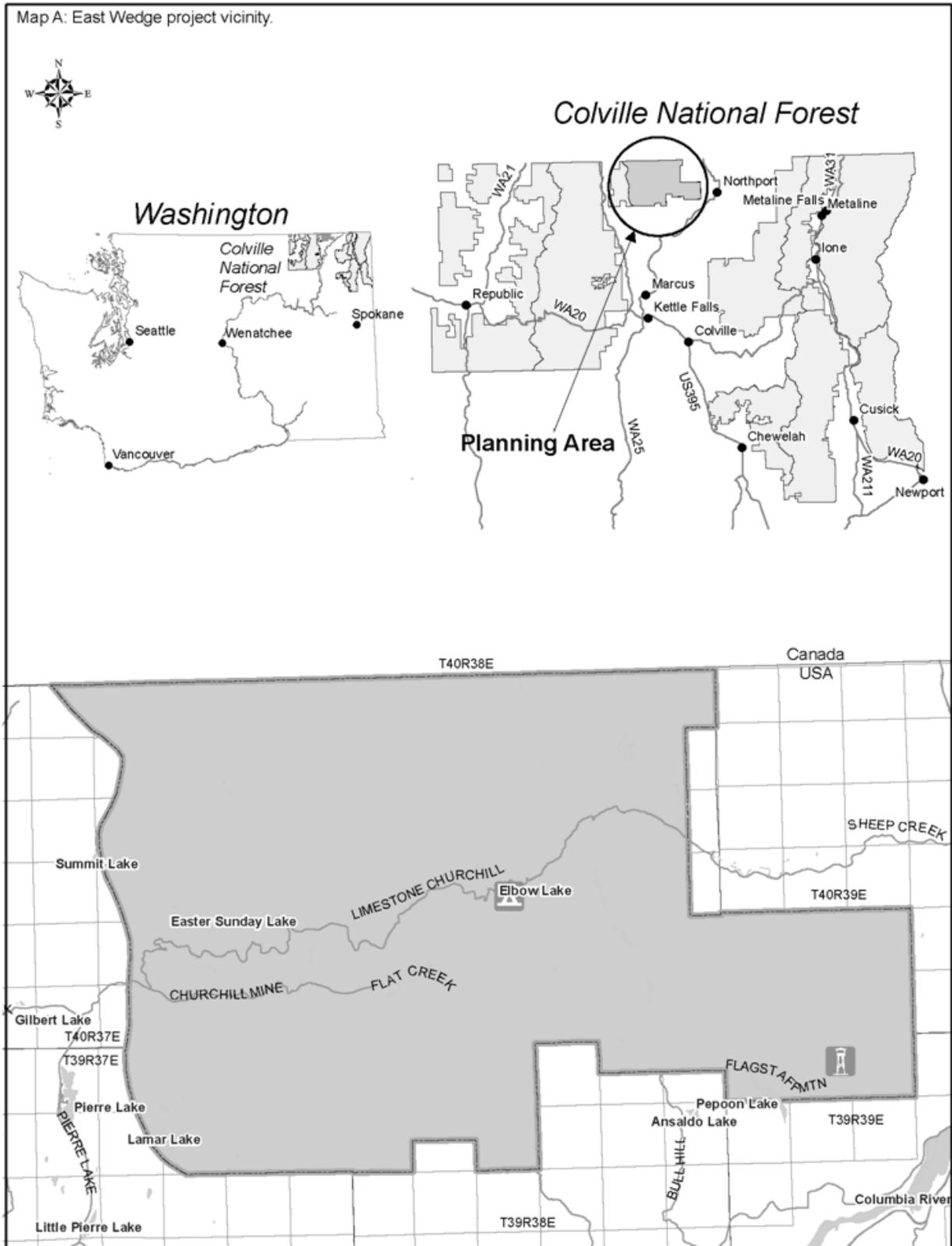
The East Wedge planning area is located in Stevens County Washington approximately 21 miles north of Kettle Falls, Washington in an area between the Kettle River and the Columbia River locally known as “the Wedge” The project area is approximately 43,692 acres, not including approximately 5,626 acres in private or other ownership and extends from the vicinity east of Pierre Lake north to the United States-Canada border. (See Map A).

The East Wedge Project planning area occupies portions of two significant 4th field sub-basins; the Kettle and the Franklin D. Roosevelt Lake sub-basins. Both sub-basins cross the US/Canadian Border but this project only deals with the US portion of these sub-basins. The Kettle sub-basin is further divided into the Boulder watershed and then the Deep Creek and Toulou Creek sub-watersheds. The Franklin D. Roosevelt Lake sub-basin is divided into the Onion Creek watershed containing Big Sheep Creek, Five Mile Creek, Crown Creek, Rattlesnake Creek and Flat Creek sub-watersheds. The proposed action described below would occur on National Forest System lands in these seven sub-watersheds. This analysis is a collaborative effort with the Stevens County Conservation District (SCCD) and the Forest Service (FS).

Geographically, the East Wedge resides within the Kootenay Arc, once a coastal plain and continental shelf, now a belt of tightly folded Precambrian and Paleozoic sedimentary rock with intrusion of granite. Deposits of glacial drift are found throughout the area—a result of glacial ice during the Pleistocene epoch. (Cultural Resource Inventory for the East Wedge Project, Nov. 4, 2010, p. 2.)

The watersheds contain landforms representative of the Northern Glaciated Mountains. Elevations in the watershed range from approximately 1,500 feet near the Columbia River to approximately 5,051 feet at Horn Mountain. Slopes range from 1% to 60% across the watershed.

Mean annual precipitation ranges from 20-35 inches. Generally an average of 60% of the precipitation occurs as snow.



PURPOSE AND NEED

The Purpose and Need for the East Wedge project focused on two areas: fuels reduction and forest health.

Fuels Reduction

During the past century, fire suppression has contributed to heavy ground and ladder fuel conditions, and increased over-stocked stands in much of the East Wedge planning area. As these hazardous fuels have increased over time, the potential for high intensity stand-replacing fires (or crown fires) has also increased. Wildfires are becoming increasingly expensive to suppress, dangerous to firefighters and members of the public, threatening to wildlife habitat, water quality and quantity, recreational use, and adjacent property.

Purpose: Break up the existing fuel continuity on National Forest System (NFS) lands to reduce the risks of wildfire damage to federal and non-federal lands and structures.

Need: Stand conditions are such that fuel reduction methods are needed to thin and/or remove the vegetation, reduce ladder fuels, and remove surface fuels.

According to 16 USCS § 6511 (16), [Title 16. Conservation; Chapter 84. Healthy Forest Restoration; Hazardous Fuel Reduction on Federal Land] the term wildland-urban interface means-- “(A) an area within or adjacent to an at-risk community that is identified in recommendations to the Secretary in a community wildfire protection plan...”

The Stevens County Community Fire Protection Plan identified at-risk areas for the Stevens County area including the East Wedge project area.

A portion of the planning area contains approximately 12,637 acres that are within the Stevens County Community Wildfire Protection Plan (SCCWPP) identified as Wildland Urban Interface (WUI). Additional portions of the proposal related to fuels, is the 1.5 miles along the US-Canada border referred to as the Canadian Border Zone (CBZ) which contains approximately 9,172 acres. Because of the proximity of the planning area with the Canadian border, it was determined to treat this area in the same manner as a designated WUI in an effort to reduce the potential for a large wildfire on National Forest system lands to cross into Canada.

Among the primary concerns listed in the SCCWPP for this area, identified as Strategic Planning Area #1 - Sheep Creek, are defensible space, forests fuels buildup, and lack of access. The fire risk rating in this area is moderate. There is a need to reduce fuels in the WUI and CBZ and to decrease the probability that a future wildfire would develop into, or be sustained as, a stand replacing or crown fire.

During the planning process for the East Wedge project, key routes were identified in and out of the planning area and areas of higher use and importance on NFS land like campgrounds and radio repeater sites. The fuel conditions along these roads typically include dense canopies or ladder fuels with moderate surface fuel loadings. Should a larger wildfire event occur and threaten to spread along or across these roads, most of them would be unsafe to travel and ineffective as fire breaks to help stop fire spread. There is a need to create defensible space

along these roads while increasing fire fighter and public safety and improving the ability to control fire spread.

Measures Used in the Analysis

- The number of acres treated within the WUI and CBZ to move towards Fire Regime Condition Class 1.
- Acres/miles of treatments along major access and egress roads to improve fire fighter and public safety.

Forest Health

Due to fire suppression and past management resulting in biomass accumulation, stand treatments are needed to reduce susceptibility to continuing insect and disease-caused mortality, and reduce susceptibility to cyclic repetitions of stand-replacing fires.

Purpose: Improve overall forest health on NFS land through active management as it relates to the forest health within the planning area.

Need: Due to fire suppression and past management resulting in biomass accumulation, stands are limited in their ability to function within their historic range of variability. Stand treatments are needed to reduce susceptibility to continuing insect and disease-caused mortality, promote late-successional characteristics and landscape level diversity, develop or protect horizontal and vertical forest structure, and reduce susceptibility to cyclic repetitions of stand-replacing fires.

Forest structure (size and arrangement of trees) in the planning area has changed over time, from stands dominated by large trees in multi-storied conditions to overstocked multi-storied stands of small trees and more uniform stands of smaller trees. These changes largely occurred due to historic forest practices, fire suppression, and insect and disease caused mortality.

Fire suppression reduced the natural tree thinning action of fire in the planning area, resulting in denser forests. Trees growing closely together are in direct competition with each other for light, water, and nutrients so the trees become less vigorous and more vulnerable to insects and diseases. The resulting increase in insect- and disease-caused tree mortality adds to the already heavy fuel load. There is a need to treat these stands to improve stand vigor, decrease the susceptibility to insects, and to promote existing healthy trees of species resistant to fire and strains resistant to disease. This would decrease the stand flammability and the rate of dead fuel production

The East Wedge is dominated by forested acres with substantial inter-tree competition. Bark beetle populations are currently endemic, living on the fringes of root rot pockets and occasional down and broken off trees. Scattered trees have defoliating insects. Mistletoe is evident in older larch trees that are competing with multiple specie understories.

Current defoliator populations are endemic, however stands heavily stocked with Douglas-fir and grand fir in the overstory and understory are highly susceptible to a defoliator outbreak due to multi-story structure.

Schweinitzii, *armillaria*, *tomentosus*, laminated rot root, butt rots: Western larch, lodgepole pine and Douglas-fir dwarf mistletoe are all present in the project area and the prevalence is likely increased from the historic range of variability due to past harvest and fire suppression. Western larch mistletoe is far more prevalent and influences how stands are thinned or regenerated.

Douglas-fir bark beetles are present in the Douglas-fir trees infected with root rot. There are mountain pine beetles in lodgepole pine, western pine beetle in ponderosa pine, fir engraver in grand fir and subalpine fir, various other minor beetles present. Red turpentine beetles are also present in ponderosa pine and although not causing mortality they definitely attack weakened trees including those already weakened by bark beetles.

Since the FS cannot treat every acre of land, treatments need to be strategically placed to achieve the greatest efficiency. Treatment of the greatest amount of the strategic area would maximize the Forest's ability to achieve the purpose and need.

Measures Used in the Analysis

- The number of acres treated to reduce overstocked stands and susceptibility to insect and disease infestations.

THE PROPOSED ACTION

The Forest Service is proposing to manage hazardous fuels and vegetation in the East Wedge planning area (see Vicinity Map A, page 2). The East Wedge project would reduce hazardous fuels and foster growth of fire resilient forests. The Proposed Action would treat about 14,960 acres in 412 stands. Treatments would consist of mechanical harvest, hand treatment and prescribed fire. The treatments are shown on Map B and Map C in Appendix A. Treatments are summarized in Table 1 below and discussed in detail as the proposed action in Chapter 2 of this document.

Table 1. Proposed Action

Reason for Treatment	Acres
Forest Health Acres	5108
Fuels Reduction Acres	6624
Fuels Reduction & Forest Health Dual Purpose Acres	3228
Total Acres	14960

To determine how each of the proposed actions meet the purpose and need, a primary purpose was assigned to each proposed polygon (stand), based on whether the stand would be primarily treated for fuels reduction or forest health. (All stands treated for forest health also benefit fuels

reduction and stands treated for fuels reduction create healthier tree conditions.) Some proposed treatments meet both objectives, particularly those along major ingress and egress routes.

All stands designated for precommercial thinning were placed in the Forest Health category and would be treated to improve growth, improve species mix, remove mistletoe infected trees and promote trees resistant to root rot.

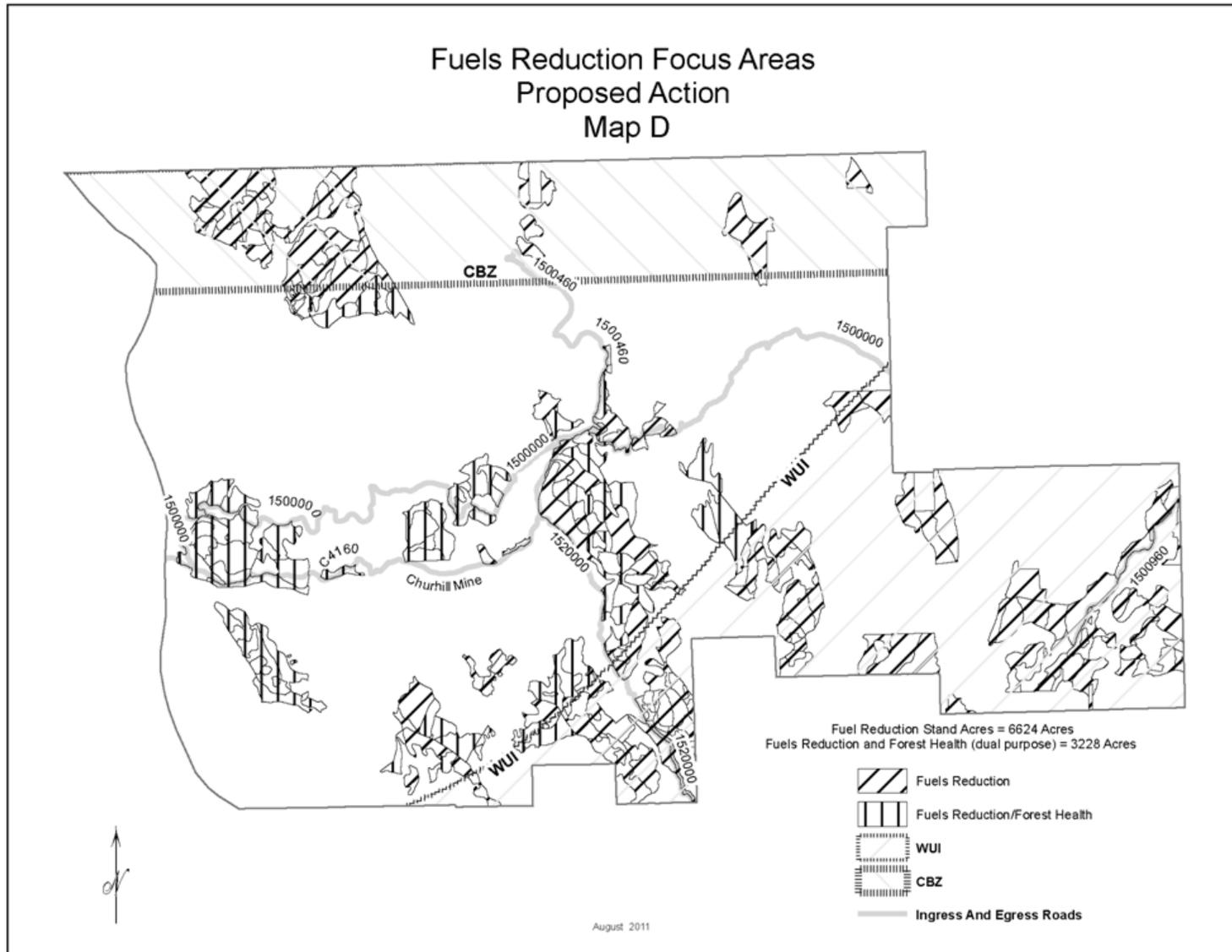
Stands proposed for treatment in the WUI and the CBZ were designated for Fuels Reduction.

Stands proposed for treatment along the ingress and egress roads are either Fuels Reduction or Fuels Reduction and Forest Health (dual purpose). The remaining stands were proposed for treatments because of Forest Health reasons.

Some stands proposed for prescribed fire only are on hot slopes (southern aspects) where fire will burn very freely and help return these areas to Fire Regime Condition Class I. Burning these stands and others will consume surface fuels and decrease ladder fuels. Prescribed fire stands and harvest stands are bunched together where possible to break up chunks of landscape and slow the movement of large fires, breaking up the fuel mosaic and improving fire suppression capabilities.

This same effort to break up the landscape for fires also breaks up the landscape for fuel loading, tree species composition and movement of many insects that affect forest health.

This analysis is based on using whole stands even though the artificial boundaries of the CBZ and WUI dissect stands. A strict GIS analysis would reveal a different acreage. Areas proposed for treatment are displayed in Map D and Map E.



DECISION FRAMEWORK

Based upon the effects of the proposed action as they relate to the purpose and need, public input, and the project file in its entirety, the responsible official will decide:

- *The specific areas, if any, that would be treated to reduce fuels and/or improve forest health to support the reduction of flammable conditions.*

If the responsible official decides to take action, (s)he will also decide:

- *The specific activities that would take place on the areas selected for treatment. These specific activities include the silviculture prescriptions, logging methods, and fuel treatment methods.*
- *The associated actions that would be included, such as road construction, reconstruction, post-activity road management, danger tree management, noxious weed treatments and specific provisions such as Best Management Practices and Design Elements.*
- *The monitoring that would be done during and after project implementation.*

MANAGEMENT AND DIRECTION

The East Wedge project was developed in response to the Stevens County Washington Community Wildfire Protection Plan (Northwest Management Inc., 2007), the Northwest Border Arrangement for Fire Protection British Columbia/US Operating Guidelines, and the Colville National Forest Land and Resources Management Plan (USDA Forest Service 1988).

This Environmental Assessment is guided by federal and state law, including the Forest and Rangeland Renewable Resource Planning Act, the National Forest Management Act, the National Environmental Policy Act (NEPA), the National Historic Preservation Act (NHPA), and the Clean Water Act. NEPA requires analysis of projects to ensure the anticipated effects are considered prior to project implementation and to determine if these effects are significant (40CFR 1502.16). The analysis for the East Wedge project followed the guidelines of NEPA as provided by the Council on Environmental Quality.

It is uncertain at this time whether any Clean Water Act National Pollution Discharge Elimination System (NPDES) permitting requirement apply, or will apply in the future to stormwater discharges from logging roads. Should it be determined that an NPDES permit is required for this project, the Forest Service will comply with any applicable NPDES permitting requirements.

Colville National Forest Land and Resource Management Plan

The Colville National Forest Land and Resource Management Plan (Forest Plan) is the guiding management direction for the East Wedge project. This Environmental Assessment incorporates the Forest Plan by reference and is tiered to the Forest Plan's Final Environmental Impact Statement (USDA Forest Service 1988) and its amendments (see below). The proposed action is consistent with the Forest Plan standards and guidelines and management area

designations and prescriptions that apply to the East Wedge planning area. A written description of the management areas follows in Table 2. Note that acreage figures were derived by the Arc Map software package, and may vary slightly from one analysis to another based on resource maps and information available.

Table 2. Management Areas in the East Wedge Planning Area

LRMP Management Area	Management Area Goal	Acres	% of Planning Area	Treatment Proposed (Acres)
MA1: Old Growth Dependent Species Habitat	Provide essential habitat for wildlife species that require old growth forest components, and contribute to the maintenance and diversity of wildlife habitat and plant communities.	815	1.7%	92 - Fire 40 - PCT
MA5: Scenic Timber	Provide a natural-appearing foreground, middle, and background along major scenic travel routes, while providing wood products.	2,807	5.7%	1,000 - Fire 113 - PCT 457 - Harvest
MA6: Scenic/Winter Range	Provide a natural-appearing foreground, middle, and background along major scenic travel routes, while providing for winter range management. Unit size for areas proposed for evenage management will have an emphasis on 10 to 20 acre regeneration units.	1,065	2.2%	408 - Fire 20 - PCT 187 - Harvest
MA7: Wood/Forage	Manage to achieve optimum production of timber products, while protecting basic resources.	33,302	67.5%	11,255 - Fire 2,312 - PCT 5,930 - Harvest
MA8: Winter Range	Meet the habitat needs of deer and elk to sustain carrying capacity at 120% of the 1980 level, while managing timber and other resources consistent with fish and wildlife management objectives. Evenage management is preferred with an emphasis on regeneration units of 10 to 20 acres.	5,698	11.5%	2,145 - Fire 279 - PCT 1,498 - Harvest
DNR & Private Lands	These are in-holdings within the project area.	5,626	11.4%	
<i>Total</i>		49,313	100%	

Forest Plan Amendments

The Forest Plan includes amendments that are also management direction for this project and include:

- Regional Forester's Forest Plan Amendment #2 entitled *Revised Interim Management Direction Establishing Riparian, Ecosystem and Wildlife Standards for Timber Sales* (USDA Forest Service 1995a). This amendment replaced the interim ecosystem and wildlife standards from Regional Forester's Forest Plans Amendment #1. In this interim direction, the Regional Forester directs National Forests in eastern Washington to maintain and/or enhance late and old structural stages (LOS) in stands subject to timber harvest. Forest Plan Amendment #2 is hereafter referred to as the "Eastside Screens."

- *Inland Native Fish Strategy* (USDA Forest Service 1995b). This amendment replaced the interim riparian standard from Regional Forester's Forest Plans Amendment #1. The Inland Native Fish Strategy is hereafter referred to as "INFISH."
- Regional Forester's October 11, 2005, amendment to forest plans in Region 6 - *Preventing and Managing Invasive Plants* (USDA Forest Service 2005a). This management direction includes invasive plant prevention and treatment and restoration standards to achieve desired future conditions, goals, and objectives.

These standards are incorporated into alternatives. Alternatives analyzed in detail are consistent with all Forest Plan amendments.

Inventoried Roadless or Congressionally Designated Areas

The project area does not contain any inventoried roadless areas, potential wilderness areas, existing or candidate Congressionally Designated areas.

National Forest Management Act

The National Forest Management Act (NFMA) includes provisions applicable to all projects and requires the following: (a) resource plans and permits, contracts and other instruments shall be consistent with the Forest land management plan; (b) ensure consideration of the economic and environmental aspects of management, to provide for outdoor recreation, range, timber, watershed, wildlife, and fish; and (c) provide for diversity of plant and animal communities. All of these considerations and requirements are addressed in this EA and the various resource reports in the project analysis file. Therefore, project actions are consistent with the provisions of NFMA.

PUBLIC INVOLVEMENT

Public notices were provided and public meetings were held to encourage meaningful public participation during the inventory and proposed action development and during the scoping period of the East Wedge project. The general public, other agencies and other governments were invited to participate and comment, via letter or during public meetings, on several occasions,. A detailed discussion of the public involvement is located in Chapter 4.

Tribal Consultation

Letters inviting consultation were sent to the Confederated Tribes of the Colville Reservation, the Spokane Tribe, and the Kalispel Tribe of Indians on January 8, 2010, March 3, 2011, and September 27, 2011. These same governments were contacted with the opportunities letter, public meeting notices, and scoping letter. Input was received from the Tribal Historic Preservation Officer, Spokane Tribe of Indians, stating there were no known cultural resources in the area of potential effect.

Public Participation

The East Wedge Project was first listed in the April 1, 2010, edition of the Colville National Forest Schedule of Proposed Actions (SOPA) and has appeared in the SOPA every three months since that date.

Letters/Public Meetings

The letter notifying the public of an opportunity for input on the proposal was mailed January 11, 2010, to 92 members of the public, adjacent landowners, and government agencies outlining the opportunities for fuel treatments in the planning area, asking for input in developing the project, and announcing a public meeting on January 20, 2010. The public meeting presentation included project goals and objectives, how comments would be used to develop the proposed action, and a request for participants to share their knowledge and expertise of the local area.

A second public meeting/presentation and request for public input was held August 17, 2010, with approximately 120 letters of invitation mailed August 3, 2010.

On March 5, 2011, a scoping letter was sent to 109 members of the public, Tribes, and other government agencies outlining the proposed action. The follow-up public meeting was held March 17, 2011. See Chapter 4 for a detailed discussion of additional presentations made to entities/organization.

On September 28, 2011, a notification letter was sent to all public participants announcing the draft EA was available for review, the project was entering a 30-day comment period, individuals could choose to enter a comment and the comment process was outlined. The legal notice beginning the comment period was published on September 28, 2011 with a notice in the *Colville Statesman-Examiner*. A project press release was also published in the *Colville Statesman-Examiner* on September 28, 2011.

Press Releases

Press releases appeared in the *Colville Statesman Examiner* newspaper on January 13, 2010; February 10, 2010; August 4, 2010; August 11, 2010; October 27, 2010; March 9, 2011; and September 28, 2011. Press releases were also published in the *Chewelah Independent* newspaper on February 4, 2010; August 5, 2010; October 28, 2010; and March 10, 2011.

A summary of the collected concerns were reviewed by the interdisciplinary team (IDT) April 14, 2011, and updated as additional comments were received. These comments and concerns were used to fine tune the project and its analysis.

Stevens County Participation

The East Wedge project was introduced to commissioners of Stevens County with letters of invitation to the public meetings (listed above). The commissioners received two additional project updates during 2010, and they were represented at several collaboration meetings with the SCCD, FS, and NEWFC. A copy of the EA and cover letter were hand-delivered and discussed with the commissioners on September 26, 2011.

The Stevens County Public Lands Advisory Committee was given two personal presentations during 2010, and they were mailed letters of invitations to the public meetings listed above. They were represented at a meeting held October 5, 2011.

Other Agency Participation

Copies of all letters described above were mailed to the International Boundary Commission, USDI Fish and Wildlife Service, USDA Natural Resources Conservation Service, US Homeland Security – Border Patrol, USDI Bureau of Land Management, Washington State Department of Natural Resources, Washington State Department of Ecology, and Washington State Department of Fish and Wildlife. Comments were received from the International Boundary Commission. See Chapter 4 for the detailed list of other entities/organization participations.

Northeast Washington Forestry Coalition Participation

Prescriptive guidelines developed by the Northeast Washington Forestry Coalition (NEWFC) were used for preliminary project development. The East Wedge collaboration process consisted of a series of meetings held from August 20, 2010 - February 2011, a meeting on October 5, 2011, and a meeting on February 9, 2012. The collaboration meetings were open to the public. NEWFC was sent letters of invitation to the public meetings described previously. NEWFC members attended the January 20, 2010, and March 17, 2011, public meetings.

Stevens County Cattlemen's Association

Project presentations were provided to members of the Stevens County Cattlemen's Association during December 2010, February 2011 and October 5, 2011. They received invitation letters to the public meetings listed previously. Forest Service grazing permittees with allotments in the East Wedge project area were invited to all public meetings.

Tri-County Motorized Recreation Association (TCMRA)

Project presentations were provided to TCMRA members in December 2010 and February 2011, and they received invitation letters to attend and participate in the public meetings listed previously. They voluntarily conducted a survey of the dispersed camping sites within the project area.

ISSUES USED TO FORMULATE ALTERNATIVES

Issues were used to formulate alternatives, prescribe mitigation measures, and to define the scope of the environmental analysis. The responses received during the scoping period were reviewed and potential alternative-driving issues were identified. The issues used to formulate alternatives are described below using an issue statement and background information on the issue. Disposition of additional concerns identified during the scoping efforts are available in the project file.

Issue 1—Roads

Road construction, and associated effects, was brought up at public and internal meetings as an activity of concern. Construction of system roads may result in a variety of impacts to the ecosystem. If close enough to riparian systems, displacement of soil from road construction can result in sediment-related impacts to local streams and associated fisheries. Any system road construction results in the removal of productive lands to an allocation of facilities management. In addition, system roads require long-term maintenance. The proposed action includes construction of approximately six miles of new system roads.

The proposed action includes the decommissioning of approximately 7.8 miles of maintenance level 1 (closed) system roads on the National Forest system. The decommissioning of these roads is designed to offset the resource impacts that could occur from construction of new system roads.

Issue 2—Acres Treated to Address Fuel Levels and Forest Health

Part of the purpose and need for this project is to reduce fuels in areas where a wildfire could result in stand replacing fire conditions, and to improve forest health by treating stands that have high levels of insect and disease populations. While the proposed action treats many acres within the planning area it does not treat all acres where conditions identified as needing correction are addressed.

CHAPTER 2. DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

INTRODUCTION

This chapter describes the proposed action and alternatives for the East Wedge project and how they were formulated. This chapter is the heart of the document and provides readers and line officers with an executive summary of the entire project, displaying the proposed action, alternatives to the proposed action, and monitoring requirements. Action alternative details considered are included in the Design Elements in Appendix C.

Proposed Action Formulation

An Interdisciplinary Team (IDT) developed a list of strategic treatments for fuel reduction in the planning area and presented them to the public by letters and at meetings. The meeting notes and comments received were considered by the Forest Service during project development and used to develop the proposed action. The draft proposed action was presented to the public by letter and a public meeting on March 17, 2011. Throughout the planning process concerns raised by the public, other agencies, governments, internal scoping, County Commissioners, the Tri-County Motorized Recreation Association, Stevens County Cattlemen's Association and the NEWFC were screened to identify those that related to potential impacts of the proposed action, and that are within the control of the Forest Service and scope of the project. These concerns were reviewed by the Forest Supervisor and are tracked throughout this document. Based on that review and public concerns, an alternative to the proposed action was developed. These actions are described in this Environmental Assessment (EA).

Alternatives Considered, but Eliminated from Detailed Study

An alternative was considered to address the issue related to harvest levels. This alternative was developed to address comments made during scoping and public meetings. Some commenters questioned whether enough acres were being considered for treatment during the proposal development. During the development of the Proposed Action a preliminary proposal was developed which treated higher levels of even-aged management and required higher levels of road construction. These treatments would have resulted in unacceptable resource impacts. To reduce potential impacts of this level of treatment to other resources and to meet requirements of the Eastside Screens and Forest Plan riparian management standards and guidelines, some road construction was reduced, some treatment levels were reduced and some treatment areas were altered or eliminated. These treatments, as modified, became the proposed action. Therefore this preliminary alternative was eliminated from detailed study.

An alternative was considered that would not construct any system or temporary roads in response to requests from some commenters during scoping. Preliminary analysis revealed that approximately 553 acres would not receive treatment: 30 acres in the WUI; 350 acres in the CBZ; and 173 acres to improve forest health. The purpose and need for this proposal is directly related to these objectives. The responsible official determined that some access beyond what is currently available would be needed to meet these needs. The proposed action, including some level of road access, could meet Forest Plan standards and guidelines and management area goals and objectives. Therefore, an alternative with no system or temporary road construction was eliminated from detailed study.

ALTERNATIVES CONSIDERED IN DETAIL

No Action Alternative

The No Action alternative would continue with a management policy of fire exclusion. Under the No Action alternative, no stand treatments would take place and there would be no temporary or system road construction. Other activities currently occurring within the analysis area would continue. These include road maintenance, fire suppression, recreational activities, and firewood cutting.

Design Elements

Design elements for all action alternatives are displayed in Appendix C and Best Management Practices are displayed in Appendix E. Implementation of both design elements and best management practices are considered in the effects discussion in Chapter 3.

The Proposed Action

Fuels Reduction

The proposed action was developed to break up the existing fuel continuity in the project area to reduce the risk of wildfire damage to federal and nonfederal lands and structures within the WUI and CBZ.

The proposed action is designed to decrease fuels in the three fuel layers: crown or canopy fuels, ladder fuels, and surface fuels. Approximately 12,200 acres in 412 stands would receive either mechanical treatment, prescribed fire treatments, or both, to address fuel levels. Fuelbreak treatments would cover 910 acres. Prescribed fire-only treatment would be implemented on 4,070 acres. The proposed action would treat approximately 11,000 acres in Fire Regime Condition Class¹ (FRCC) 2 and 710 acres in FRCC 3, moving these acres towards FRCC 1. Additionally, the proposed action would treat 1,620 acres in the CBZ and 3,740 acres in the WUI areas through various mechanical and/or prescribed fire methods (not including PCT). Tables 3 and 4 summarize the treatments that would be used for the proposed action.

¹ Condition Class is one way of determining a stand's potential risk to wildfire.

Condition Class 1: stands are within historic fire cycle;

Condition Class 2: stands have missed at least two fire cycles;

Condition Class 3: tree stands are dense with intense fire burning in most tree crowns; wildfire would cause heavy mortality to entire stand and the soil's organic layer may be removed.

Fire Regime I – high frequency, low severity fires (e.g., large ponderosa pine stands);

Fire Regime III – mixed severity fires (e.g., found in mixed Douglas-fir, western larch, grand fir stands)

Table 3. Treatment Summary for the Proposed Action

Diagnosis Rx Treatments	Acres
Prescribed Fire	4,067
Precommercial Thinning	2,759
Biomass Thinning	498
Fuelbreak Treatments	910
Shelterwood Seedcut	229
Shelterwood Seedcut with Prescribed Fire	453
Commercial Thinning	340
Commercial Thinning with Piling & Burn	341
Commercial Thinning with Prescribed Fire	517
Variable Density Commercial Thinning with Prescribed Fire	4,215
Variable Density Commercial Thinning skid Tops attached	423
Salvage with Prescribed Fire	18
Free and Group Selection with Prescribed Fire	190
Total Acreage	14,960

Table 4. Surface Fuel Treatments for the Proposed Action

Diagnosis Rx Treatments¹	Acres	Percent of FS Acres in the EW planning Area²
Prescribed Fire	4067	9.3%
Biomass Thinning	498	1.1%
Fuelbreak Treatments (further break down below)	910	2.1%
Shelterwood Seedcut	229	0.5%
Shelterwood Seedcut with Prescribed Fire	453	1.0%
Commercial Thinning	340	0.8%
Commercial Thinning with Piling & Burn	341	0.8%
Commercial Thinning with Prescribed Fire	517	1.2%
Variable Density Commercial Thinning with Prescribed Fire	4215	9.6%
Variable Density Commercial Thinning skid Tops attached	423	1.0%
Salvage with Prescribed Fire	18	< 0.1%
Free and Group Selection with Prescribed Fire	190	0.4%
Total Surface Fuel Treatments	12201	27.9%
Other Treatments		
Precommercial Thinning	2,759	6.3%

1. Includes untreated patches within units.

2. Rounded to the nearest 1/10th percent.

Vegetation Management to Reduce Fuels

See Appendix D for a detailed discussion of vegetation management to reduce fuels.

Forest Health

The proposed action would use both mechanical and prescribed fire treatments on 10,900 acres in 412 stands to address forest health issues. This includes treatment of 6,390 acres of overstocked stands. Regeneration harvest includes (approximate acres):

- 578 acres (17 stands) using shelterwood systems;
- 682 acres (about 12% of the 5,836 acres of variable density thinning) in openings of 1 to 10 acres in size;
- Eleven acres of group selection within one stand; and
- Thirty-nine acres across nine stands within fuel breaks to reduce effects of root disease.

The one to 10-acre openings in the variable density thinning are focused on existing *armillaria* and laminated root rot areas where the infected species cannot be sustained and a more resistant tree species needs to be established. Root rots vary from stand to stand and species to species. Two stands are predicted to have about 37% of their area in openings due to root rot.

The proposed action would treat approximately 32% of the acres currently infested with bark beetles and 23% of the acres showing evidence of defoliating insects.

Roads

A discussion of road needs and modifications are individually addressed below. Map F displays current open roads, proposed new system road and temporary road construction, road reconstruction, closed roads proposed for decommissioning and rock sources. Existing roads, old skid trails, and other previously impacted areas would be reused as much as possible. These opportunities are identified in the analysis.

Property owners do not appear to be supportive of a permanent easement across their property within these areas. Therefore temporary permits would be pursued to units in T40N, R38E, Sections 3, 10, and 25; T40N, R 39E, Sections 28, 30, 32, and 33; units in T39N, R39E, Sections 4, 5 and 6.

One of these private roads would provide access needed to complete commercial thinning and prescribed fire (fuel reduction in the WUI area adjacent to Forest Road 1500960) in stands in the southeast corner of the planning area. Access across this road for future management needs would be considered under separate analysis.

The FS would not authorize public use of the temporary roads during or after project implementation.

Impacts of the needed access and road improvement activities are included in the effects discussion for the individual resources in Chapter 3 of this document.

New System Road Construction

Within the project area, approximately 5.9 miles of road construction are proposed to facilitate the treatment of stands identified within the proposed action. New roadways would be developed based on the site and anticipated use where a NFS road does not currently exist. New roads would be needed for long-term management and are intended to serve multiple use needs

as a long-term facility. They would be periodically maintained; frequency and degree of maintenance would depend on the assigned maintenance level and available funding.

Temporary Road Construction

Approximately 3.75 miles of temporary roads would be constructed under the proposed action. The term “temporary” is a Forest Service Timber Sale Contract term used to define those roads to be constructed by the timber purchaser for the sole purpose of treating a specific unit. The intent of these roads is to use them for the short-term only, after which they would be closed, effectively obliterated, seeded, and put back into resource production within 10 years of contract completion. Roads currently planned as temporary construction would be assessed during project implementation and its category adjusted as needed. Any roads planned for specified construction may shift to temporary based on field conditions and specialist input provided at time of layout.

Road Reconstruction

Within the proposed action, approximately 62 miles of existing road are recommended for reconstruction to facilitate the treatment of stands. Specific work items for road reconstruction would be determined during the layout or presale phase of implementation of this project. Road reconstruction is defined as an activity that results in improvement or realignment of an existing classified road. Three types of road reconstruction may be required in the proposed action: light, medium and heavy.

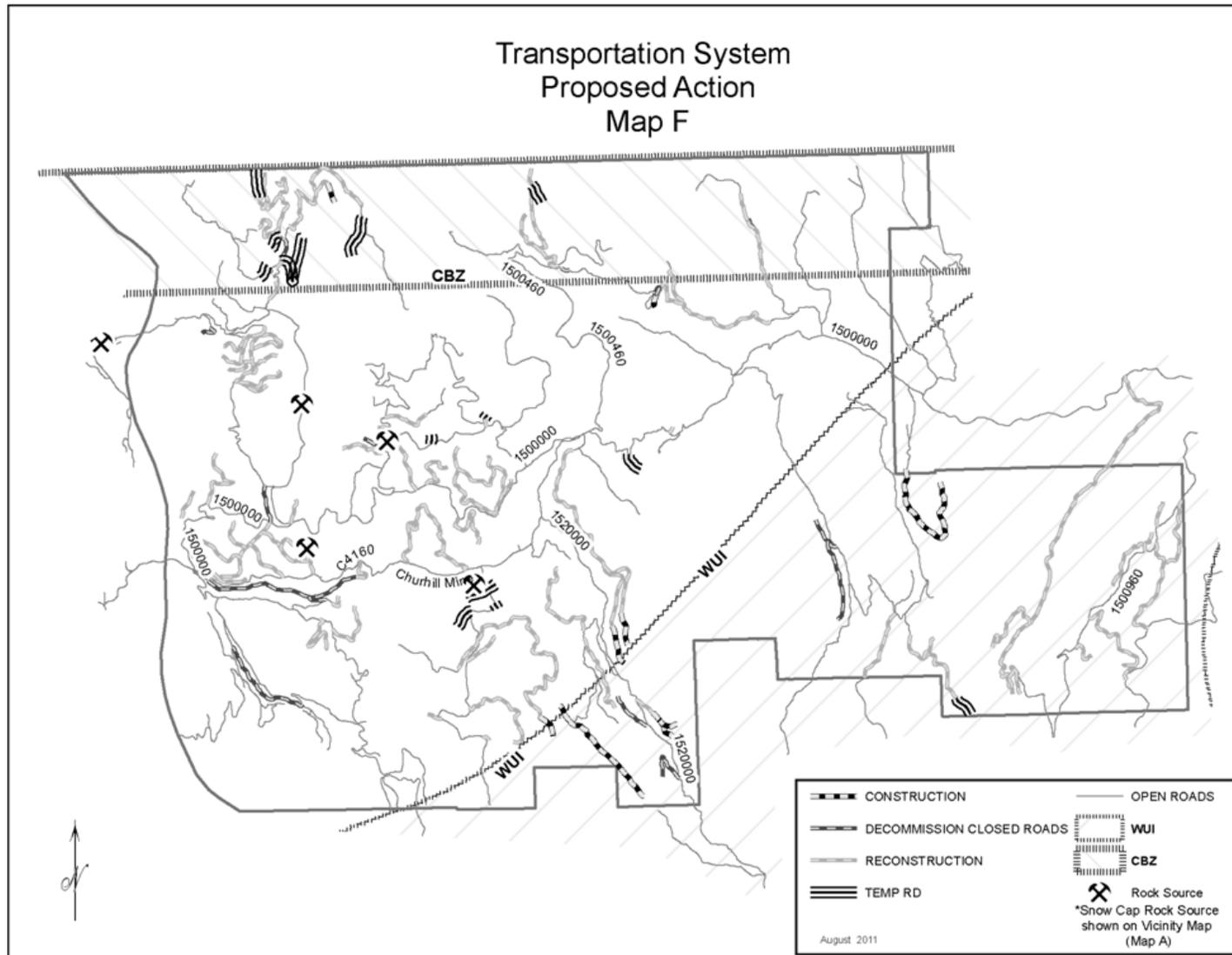
Road Decommissioning

Also included within the proposed action are approximately 7.8 miles of system roads, all with operational and objective maintenance levels of 1 (closed roads), that have been identified as priority candidates for decommissioning in this planning area. The decommissioning of these roads is designed to offset the resource impacts from primarily constructing new system roads, temporary roads and reconstructing current roads. These roads would be considered for decommissioning after the proposed harvest activities and post harvest treatments associated with the project are completed.

Rock Sources

There are three existing and two inventoried rock sources within the planning area and one existing source southwest of the planning area within a distance of less than 15 miles. These sites are summarized in the following discussion. Given the glacial (6-8” minus) makeup, with the exception of Snowcap #1277, and the relative lengthy haul distances to these existing sources, it may be desirable to locate and develop new harder, angular sources within this planning area to minimize aggregate and riprap costs needed in the short and long-term to accomplish road construction, reconstruction and maintenance activities. Commercial rock sources are available in the Colville area, but it is more economical to develop new sources or utilize existing sources on NFS land due to the shorter haul distance as compared to that of commercial sources. As part of the Summit Pierre project, test excavations were conducted in May 2009 at three sites to determine the potential for the development of crushed aggregate, pit run aggregate, and riprap at each site. This exploration narrowed the potential sources down to two sites, Easter and Deep Creek, both along road 1500180.

- **Big Iron #1286** (T40N R37E NW1/4 SW1/4 Sec 24). Records indicate that this existing pit run source, located approximately ¼ mile north of Big Iron Mine on road 1500290, is comprised of glacial till overlying meta-sedimentary rock. The material produced, via sorting or screening, is generally 6” minus in size and is suitable for borrow or backfill, not recommended for drain dip rock or road surfacing due to its rounded and sandy characteristics.
- **Mineral Mtn. #1287** (T40N R38E NE1/4 NW1/4 Sec 31). This existing pit run source is located approximately ¼ mile south of road 1520000 at the end of road 1520072. Records indicate that material is comprised of metamorphosed sedimentary sequence covered by glacial till. Pit run material (largely 6” minus in size) from this source would be suitable for borrow and backfill but is generally considered less desirable than angular rock for armoring drain dips and hardening road surfaces due to its rounded shape and sandy component.
- **Pierre Creek #79** (T40N R37E SW1/4 SW1/4 Sec 26). Located on road 1520028, this existing glacial pit run source, comprised of 8” minus material would be suitable for backfill or borrow. It is not recommended for drain dip armoring or road surfacing. Proximity to unnamed drainage just east of pit location limits the development of this site eastward minimizing the value of this site long-term. This site is popular with dispersed campers and hunters.
- **Snowcap #1277** (T38N R36E NW1/4 NW1/4 Sec 2). This existing hard rock source, located on road 6100010, is suitable for the production of crushed aggregate and riprap. Records indicate that there is a stockpile of 1” minus crushed aggregate (approximately 2,000-3,000 cubic yards) and a stockpile of riprap (400 cubic yards). These stockpiles could be utilized but the relative lengthy haul distance, compared to that of the potential new sources identified and tested, minimizes that likelihood.
- **Easter (Hard Rock) Source #1333** (T40N R37E NW1/4 NW1/4 Sec 23). This inventoried but undeveloped potential pit is located on road 1500180 left of mile post 1.85 within the planning area. Test excavations completed indicate that this site is capable of producing grid-roll aggregates, but not riprap due to the relatively small size (1 inch to 18 inch diameter) and lack of hardness of the material. Site development costs should be minimal while yielding aggregate at a relatively low cost. Material produced was soft enough to break down by grid-rolling after 3 – 4 passes with the excavator. Resulting rock appeared well suited for use in armoring drain dips, out-slope drains or as running surface rock on low volume roads. This site, if developed, could serve the entire western portion of this planning area over the long-term. Development limits up to an acre are anticipated for this project. Long-term development limits up to 5 acres is reasonable to assume.



- **Deep Creek (Glacial) Source** (T40N R37E Sec 10). Located on road 1500030 just west of the junction with road 1500180 and just outside the planning area, this site shows potential to produce crushed aggregate at a relatively moderate cost with a single staged rock crusher. While it appears possible to screen material to produce aggregate, it is not recommended due to the substantial amount of oversized material likely to be produced. This site is suited for long-term development, with excavation limits up to 2 – 2.5 acres, while producing upwards of 50,000 cubic yards.

Alternative C

Alternative C was developed to address the issues related to constructing new system roads. It was also developed to address the issue related to OHV use and the removal of future potential OHV opportunities. This alternative eliminates the construction of approximately 5.9 miles of new system roads, decreases the road reconstruction by 0.8 miles, decreases the number of acres of prescribed fire by 159 acres, decreases fuelbreaks by 52 acres and decreases thinning by 690 acres. It also changes the authorized use of Forest Road 1500 from ‘Open to Highway Legal Vehicles’, to ‘Open to All Vehicles’. (See Map G in Appendix A)

Roads

Alternative C would not construct any new system roads. It would construct approximately 3.8 miles of temporary road, reconstruct 61 miles of existing roads and decommission 7.8 miles of closed system roads.

Fuels Reduction

A number of stands were changed to prescribed fire. No new stands were added for this alternative, and some stands were re-delineated in an effort to reflect the decrease in construction of new system roads for harvest. As a result, four acres on the south end of Flat Creek were added to stand 2440164. Table 5 identifies the treatment summaries under Alternative C.

Table 5. Treatment Summary for Alternative C

Diagnosis Rx Treatments¹	Acres	Percent of FS Acres in EW planning area
Prescribed Fire (PF)	3908	8.9%
Biomass Thinning	498	1.1%
Fuelbreak Treatments	858	2.0%
Shelterwood Seedcut with/without PF	682	1.6%
Commercial Thinning with/without burning/fire	1002	2.3%
Variable Density Commercial Thinning with/without PF	4147	9.5%
Salvage with Prescribed Fire	15	< 0.1%
Free and Group Selection with Prescribed Fire	190	0.4%
Total Surface Fuel Treatments	11300	26.9%
Precommercial Thinning	2759	6.3%

¹ Includes untreated patches within units.

Forest Health

Alternative C would provide both mechanical and prescribed fire treatments on approximately 14,060 acres in 386 stands to address forest health issues. Fuel break treatments would cover 858 acres. A treatment of prescribed fire only is planned on 3908 acres. This alternative would treat 5,534 acres of overstocked stands that exceed a stand density index (SDI) of 50% of the Maximum Density. Regeneration harvest includes (approximate acres):

- 496 acres (17 stands) using shelterwood systems;
- 623 acres (about 12% of the 5,149 acres of variable density thinning) in openings of 1 to 10 acres in size;
- Eleven acres of group selection within one stand; and
- Thirty-nine acres across nine stands within fuel breaks to reduce effects of root disease.

The one to 10-acre openings in the variable density thinning are focused on existing *armillaria* and laminated root rot areas where the infected species cannot be sustained and a more resistant species needs to be established. Root rots vary from stand to stand and species to species. Several stands are predicted to have about 37% of their area in openings due to root rot.

This alternative would treat approximately 29% of the acres currently infested with bark beetles and 23% of the acres showing evidence of defoliating insects.

The same biophysical environment considerations are important in Alternative C including fire severity and species tolerance, future old growth habitat and insect and disease connectivity and spread.

Comparison of Alternatives

The following tables compare the treatments proposed for the No Action Alternative, Proposed Action, and Alternative C. See Map G in Appendix A. Map G displays the differences between the Proposed Action and Alternative C. Treatments are for NFS land only.

Table 6. Treatment Summary

Diagnosis Prescribed Treatments	No Action Alternative	Proposed Action	Alternative C
Prescribed Fire	0	4067	3908
Fuel Breaks	0	910	858
Thinning*	0	9111	8421
Regeneration Harvests	0	872	872
Total Acres (Issue #2)	0	14960	14059

*Includes precommercial thinning acres

Table 7. Additional Comparisons

Issue	No Action Alternative	Proposed Action	Alternative C
Acres Treated in WUI	0	4121	3405
Acres Treated in CBZ	0	1617	1580
Acres Treated outside WUI/CBZ	0	9222	9074
Miles Ingress/Egress Roads Treated	0	24.5	24.5
Miles New System Road Construction (Issue #1)	0	5.9	0
Miles of road decommissioned (Issue #1)	0	7.8	7.8
Additional miles of road available for OHV Use (Issue #1)	0	0	14.5
Consistent with Forest Plan	Yes	Yes	Yes

Table 8. Purpose and Need Analysis*

	No Action	Proposed Action	Alternative C
Forest Health Acres	0	5108	5108
Fuels Reduction Acres	0	6624	5783
Fuels Reduction & Forest Health Dual Purpose Acres	0	3228	3168
Total Acres	0	14960	14059

*This analysis is based on using whole stands even though the artificial boundaries of the CBZ and WUI dissect stands. A strict GIS analysis would reveal different acreage.

Alternative C would treat 687 fewer acres of commercial thinning than the proposed action. The proposed action and alternative C would create an estimated 1,251 acres and 1,169 acres respectively of regeneration need for a difference of 82 acres. Approximately 74% of the regeneration acres would be planted to insure adequate stocking.

CHAPTER 3. ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This chapter presents information about current resource conditions in the East Wedge planning area, and the direct, indirect and cumulative effects of implementing the proposed action. The information presented in this chapter and the specialists' reports are based on the best available science. These effects, along with the entire project file and other analysis documents that are tiered to, are the scientific and analytic basis for the Deciding Officer. The full texts of the specialists' reports are available at the Three Rivers Ranger District office in Kettle Falls, Washington.

Chapter Outline

Each resource or topic area section is organized similarly as follows:

- **Introduction:** Includes an overview of the source materials and data collection.
- **Direct and Indirect Effects:** This section includes discussion of existing conditions and background information necessary to understand the analyses. Direct and indirect effects are those caused by the action and occurring at the same time and place as well as those actions that are later in time or farther removed in distance, but are still reasonably foreseeable.
- **Cumulative Effects:** This is a discussion of impacts resulting from the incremental impact of the proposed action, when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Only those that overlap the geographic analysis area boundary for each particular resource are considered and only if they are expected to have overlapping effects with the proposed East Wedge project.

EFFECTS OF NO ACTION

Introduction

A list of past, present, and reasonably foreseeable future actions within the planning area were compiled and considered during the cumulative effects analysis.

Table 9. Past, Present and Reasonably Foreseeable Future Actions

Activity	Year	Past	Present	Reasonably Foreseeable Future
Fish Barrier Culvert Replacement	2012			x
Private Property Fuels Red. Efforts*				
Pacific Northwest Trail				x
Big Sheep Creek Timber Sale		x		
Summit Pierre Timber Sale			x	x
Road Maintenance	On-going	x	x	x
Non FS Lands Harvest**	Varied	x	x	x
Dispersed Camping	On-going	x	x	x
Other Recreation Activities	On-going	x	x	x
Mining	Varied	x		x
Livestock Grazing	On-going	x	x	x
Firewood Collection	On-going	x	x	x
Danger Tree Removal	On-going	x	x	x
Noxious Weed Control	On-going	x	x	x

* While none were identified there is always the possibility this will occur on individual properties. None are considered in the reasonably foreseeable future actions or discussed in the cumulative discussions.

** As of April 24, 2012, Washington State Department of Natural Resources (DNR) reported five (5) active Forest Practice applications for harvests within the East Wedge planning area on private and State land. The list and location map are available in the project file.

Direct and Indirect Effects

The planning area is dominated by vegetation types (biophysical environments) that developed under the influence of frequent low severity fires. Frequent fires meant that the landscape

generally did not support heavy fuel loads, nor did it favor fire intolerant tree species. Stands were more open and small trees relatively sparse or patchy in distribution. Today these conditions are greatly changed. Forests are dense with small fire intolerant tree species, overstories are thick and continuous, and fuel loads are relatively heavy.

Two scenarios are possible if no action is taken. The first assumes that no uncontrollable wildland fire occurs within the planning area in the foreseeable future. The second assumes that some type of high intensity, stand replacement fire occurs. From the time period between 1943 and 2008 there were 96 fires recorded, 79 of which were caused by lightning.

Fuels and Forest Vegetation

The No Action alternative would continue with a management policy of fire exclusion, and would result in no improvement in stand vigor and related forest health. It would continue the landscape-scale trend of increasing stand densities, where stocking levels increase to the maximum capacity of the soils. Future management objectives, such as visual quality objectives, wildlife objectives, recreation and moving the stands toward or maintaining structural stages 6 or 7 may not be met. This is due to the increased insect, disease and suppression caused mortality, reduced diameter growth due to overstocked stands and the increased fire hazard that may result from not treating priority stands. This alternative also would not treat stands that occur within the urban interface to reduce the risk of insect, disease or wildfire.

No harvest or silvicultural treatments are proposed under the No Action alternative. No short-term effects associated with logging operations would occur. Conversion of stands to shade tolerant species would continue, increasing the hazard to insects, diseases and stand replacement fires. There would be no removal of diseased or establishment of disease-resistant trees. The insect and disease activity would continue to contribute to increased mortality, which would result in an increase in ladder and crown fuels and increased buildup of surface fuels. In addition, no fuels treatments or prescribed burning would occur, thereby exacerbating these problems. The intent of the Stevens County Community Wildfire Protection Plan would not be met.

Under the No Action alternative, no fuels treatments or prescribed burning would occur and no harvesting would take place. The economic value of the dead and dying trees would not be realized.

Modeling of stand data from the planning area indicates that fires have a high risk of reaching and being sustained as a crown fire. Without treatments, this risk would remain or increase. If an uncontrollable fire event were to occur, it would increasingly be more likely to become a crown fire with large patches of forest killed. Preventing the fire from spreading off NFS land would become increasingly difficult.

Assuming no wildfire event occurs, (although unlikely) the landscape would eventually reach a condition dominated by multi-story structure with large and old trees. However, the landscape would be strikingly different from the historic open, more fire resistant conditions, the conditions that the plants and animals of the area evolved under. Stands at the highest risk to uncharacteristic wildfire are those in biophysical environments that had low to moderate

severity fire historically. That describes approximately 55 to 83 percent of the planning area. Many of the stands proposed for treatment have missed multiple fire events that would have occurred without fire suppression, and run a high risk of losing key ecosystem components should a fire event occur.

Moderate or high severity fire would result in large patches of dead trees which may represent an increased fire hazard. When the dead trees fall it would increase surface fuel concentrations and reduce fire suppression capabilities because fireline construction rates are slowed by concentrations of downed wood. Additionally, concentrations of snags create hazardous conditions for firefighters and the public. Large snag concentrations can potentially set the stage for future uncharacteristic fires, particularly in biophysical environments with low severity fire regimes.

The level of late and old structure is expected to remain static under the No Action alternative. As stand densities and resulting inter-tree competition continue to increase throughout the area growth and vigor of the vegetation would decline. Stands would be more prone to injury and mortality caused by insect and disease.

Defensible Space, Access, and Egress

If neither action alternative was implemented, firefighter and public safety would not be improved as per the intent of the National Fire Plan or the Stevens County Community Wildfire Protection Plan (SCCWPP). Residents along roads accessing the planning area would continue to be at risk of having evacuation routes cut off. Access for the public and fire fighters along Forest and County roads within the planning area would not be improved. Vegetation treatments on private land would not have the benefit of depth created by treatments along the Forest boundary.

Roads

There would be no change to the existing or future road system as no roads, temporary or system, would be constructed, nor would any existing roads be decommissioned.

Soils

In the no action alternative, ecological trends and current levels of detrimental soil disturbance would continue. A great majority of project units would continue their natural recovery from historical fires and past logging. Units showing high rates of downed woody debris and organic horizons would more quickly de-compact, thus holding more soil moisture and growing more vegetation. As vegetation proliferates in these units, stands would contribute woody debris to decompose, adding needed organics and soil wood. Microorganisms would quickly inhabit sites and begin decomposition and nutrient cycling. Building a forest floor litter layer would help keep nutrients on site and decrease erosion from fire. Over time, large woody debris from dead trees would fall on the ground, thereby increasing organic matter and water holding capacities on site. These trends, in absence of catastrophic fires, would exist on most of the project units.

Wildlife Habitat

Beaver: Under the No Action alternative beaver in smaller riparian systems would continue to operate in their historical pattern: colonizing areas, depleting their vegetation, abandoning the area until woody vegetation regrows, and recolonizing the area.

Blue (Dusky) Grouse: Currently, small ponds on NFS land do not lack cover. However, vegetation in some areas is marginal for meeting needs for blue grouse hiding habitat. The No Action Alternative would maintain the existing conditions.

California Wolverine: With the No Action Alternative, there would be no short-term effects. In the long term, improvement of small mammal habitat might not occur as rapidly as might happen if one of the action alternatives was implemented.

Canada Lynx: The No Action alternative would not change potential habitat conditions in any of the lynx analysis units.

Common Loon: This species generally requires larger wetlands and water bodies. The East Wedge project area contains no large lakes (> 40 acres) or rivers with abundant fish that provide foraging and nesting habitats for loons. The No Action alternative would have no effect on Common Loon habitat.

Fisher, Barred Owl, Pine Marten: In the Forest Plan, pine martens and several other terrestrial wildlife species are identified as Management Indicator Species (MIS) representing old and mature stand structure habitat. Fishers also prefer landscapes that have a high degree of mature forest cover. Taking no action contributes toward meeting Forest Plan direction over the short-term by avoiding any treatments that may impact existing habitat for late and old structure dependent species. Over the long-term, by increasing the risk of insect infestations, disease, and uncharacteristic wildfire, it would not contribute toward development or maintenance of healthy diverse forest conditions that would continue to support these species across the landscape.

Franklin's Grouse: The USFS selected spruce (Franklin's) grouse as an indicator species to represent lodgepole pine-dependent species. The habitat capability objective is to approximate 1980 spruce grouse habitat conditions. The Forest Plan (page 4-40) directs that large areas dominated by lodgepole pine stands be managed to maintain 20% in young age classes. The No Action alternative would have no short-term impact on grouse habitat as no vegetative treatments would occur. Over the long-term the risk of insect population increases, disease spread and wildfire would increase, thereby increasing risk of losing lodgepole pine habitat preferred by grouse.

Gray wolf: The project area is located outside identified wolf recovery areas. No short-term effect is expected. Long-term effect would be related to prey availability (see effects to big-game). Overall, there would be no adverse effect to gray wolves.

Great gray owl: Great gray owls nest in many types of forested habitats and feed primarily on rodents. The No Action alternative would not directly affect potential nest sites or other great gray owl habitat components in the short term. Over the long term, the No Action alternative presents a greater risk from wildfire because many stands are overstocked and the habitat is not capable of maintaining those conditions over a long period of time. This could result in a loss of any existing great gray owl habitat and a reduction in potential habitat for many years.

Grizzly Bear: The project area does not reach high elevations with alpine/subalpine areas with deep soils where grizzlies often den, so denning habitat is unavailable. Spring forage habitats include low to mid elevation riparian areas, meadows, etc. The project area contains forage habitat, specifically along Corral Creek and American Fork of Big Sheep Creek. Since no vegetation management projects would occur, there would be no effect to grizzly bear.

Migratory birds: The No Action alternative does not result in any management-induced changes to migratory land bird habitat conditions. Forest succession continues and in the absence of other disturbances, more existing openings, riparian areas and deciduous habitats would be expected to grow closed, and the local population levels of birds requiring these more open habitats would decline. Opportunities to develop large tree, single stratum (SS7) habitat in this area would not be realized. The area would be more susceptible to stand-replacing fire, which would eliminate habitat for a wide variety of birds that depend on large, live trees. The No Action alternative does not contribute to the long-term maintenance of diverse land bird habitats.

Northern bog lemming: There are no high-elevation bogs in the project area. The No Action alternative would have neither beneficial nor negative impacts on the lemming.

Primary Cavity Nesters: Within the short-term the No Action alternative would have no impact on cavity nesters. Over the long term, by increasing the risk of insect infestations, disease, or stand-replacement fire, the No Action alternative does not contribute toward development or maintenance of healthy, diverse, forest conditions that would continue to support these species across the landscape and over time. A stand replacement fire would cause a flush of snags, which would benefit pileated woodpeckers in the short term, but would result in a long-term decrease because once the dead trees fell, most in about 20 years, the area would not provide pileated woodpecker nesting habitat until large trees again grew on the site, at minimum about 100 years after a fire.

Townsend's Big-eared Bat: This bat roosts and hibernates in caves or mine shafts but may also use cavities in large trees or snags. The Forest Plan does not contain specific standards and guidelines or management direction pertaining to Pacific western (Townsend's) big-eared bats. The objectives are to protect internal microclimate conditions of mines, caves and structures associated with roosting, hibernating and/or reproducing bats and to protect roosting, hibernating and/or reproducing bats from human disturbance. Since no vegetative management would occur under this alternative, there would be no effect to big-eared bats.

Sandhill Crane: Sandhill cranes occupy open, wetland habitat which does not occur in the project area. Therefore, there would be no effect.

Big game: the existing forage:cover ratio within winter range areas would not change. Habitat would not improve, and conditions on summer and winter range for deer would continue to decline as understory trees encroach into open stands and continue to reduce forage. Without adequate forage, this area would not provide suitable ungulate habitat and would not contribute toward meeting the Forest Plan objective for deer population levels. The No Action alternative would not affect existing open road densities or habitat security. Without thinning, a stand-replacing fire in the watershed could eliminate overstory cover but would also create the conditions for a great flush of forage.

Woodland Caribou: The East Wedge Project area is located more than 20 miles outside of a woodland caribou recovery area and does not contain suitable woodland caribou habitat. Therefore, there would be no effect.

Sensitive Invertebrates: There would be no short-term effect to meadow fritillary, Great Basin fritillary, Rosner's hairstreak, fir-pinwheel, magnum mantleslugs or masked dusksnail. Over the long-term trees would encroach on meadows and reduce habitat for meadow-dependent species.

Riparian Areas, Fisheries, and Hydrology

There would be no adverse effects to fisheries for the No Action alternative, as long as a stand-replacing fire does not occur. The status quo would be maintained. Sediment would not reach levels that would cause a detriment to fisheries. If a stand-replacing fire occurs, there could be a temporary drop in the fish population until the stream heals and vegetation returns. If a large storm event occurs within the recovery period after a stand-replacing fire, debris torrents may occur in burned over watersheds. It can be expected that refugia would exist for fish within the watersheds.

The No Action alternative would have no direct, indirect or cumulative effect on the hydrology resource of the project area.

Sensitive Plants

The most likely effect that would occur under the no action alternative is continued fire suppression which would have unpredictable effects on the canopy, but would probably cause it to become denser as trees grow. Up to a certain point this would be beneficial to sensitive plants, but when the canopy becomes so dense that all sunlight is blocked, it is probably detrimental. Some stands have already reached this point. Increased canopy density would be accompanied by increased competition for soil resources and duff accumulation, which would be detrimental to all of the sensitive plants in the short term. Over longer terms, trees would naturally thin and return to an old growth condition or else experience a fire. Scalloped moonwort, kidney-leaved violet, Maryland snakeroot and purple avens tend to benefit from late seral conditions except purple avens, and to a small extent, Maryland snakeroot. The net effect on sensitive plants of fire suppression would be a short term negative effect and a long-term benefit.

Wildfires cause both positive and negative effects to sensitive plants. Impacts due to surface fire may kill individual populations; however canopy opening and relief from competition can stimulate fruiting and sprouting. The net effect of wildfires would be to extirpate some sensitive plants but allow new plants to establish.

Dense vegetation that impedes livestock grazing would increase and have a net benefit for sensitive plants. Other impacts described above are judged unlikely to affect sensitive plants by a no-action alternative. The plants would continue to grow as they are presently doing.

Noxious Weeds

Surveys in 2010 identified several noxious weed species including hoary alyssum (*Berteroa incana*), sulphur cinquefoil (*Potentilla recta*) and hawkweed species (*Hieracium* sp.) in the East Wedge project area. These species are listed as Class B weeds by Washington State. In areas where they are already abundant, containment is a primary goal. The noxious weed populations are mostly associated with forest roads and trails.

Given that several different species of noxious weeds occur within the project area and that some of the private property bordering the East Wedge project area has established noxious weed populations, it is likely that noxious weeds would continue to occur within the project area. Given similar abilities and funding to treat noxious weeds in the future it is expected that the overall number of acres infested with noxious weeds will continue to increase above current levels.

Based on current trends and the Colville National Forest's ability to treat noxious weeds it is expected that most noxious weed species would likely increase slightly within the project area despite the Colville National Forest currently treating noxious weeds that occur. Hoary alyssum seems to have a much larger potential to increase in distribution because it is a fairly new plant on Forest Service lands, it produces an abundance of seed, it will establish in undisturbed areas such as open south facing slopes, and is more difficult to control given the Colville National Forest's currently available control methods.

Heritage

Fire suppression has allowed for the continued buildup of fuels from downed woody debris and from the density of trees, and could cause an adverse effect to historical properties because unchecked fire within the planning area would destroy standing and downed historical structures, potentially affecting National Register eligibility characteristics of these properties.

Range

There would be no expected change to grazing management or forage availability in the short term. Long-term changes in vegetation could reduce forage as canopies close in and trees encroach into meadows. Catastrophic wildfire could create hardships for grazing permittees by causing widespread damage to grazing allotments, including removal of natural barriers. and range improvements such as fencing and water developments.

Recreation

Trails

There are no developed hiking trails within the planning area. However, the Pacific Northwest Trail is proposed as a National Scenic Trail. The proposed route goes east to west from Glacier National Park (Montana) to Neah Bay on the Pacific Coast of Washington. While the final route has not been determined, a portion of the proposed route crosses through the East Wedge planning area. Since there is no defined location for this trail, no additional analysis was completed.

Motorized (OHV) Recreation

No immediate change would occur in the quality of the OHV experience in the East Wedge project area if the No Action alternative is selected. The availability of legal OHV riding opportunities (those identified on the Colville National Forest Motor Vehicle Use Map) would remain the same and the setting in which those opportunities exist would remain reasonably unaltered in the foreseeable future. Existing levels of legal and illegal OHV use would continue to increase slowly as the area's population increases, depending on external factors such as the state of the economy (local job market) and the price of fuel.

Over time, however, the likelihood of a large fire event would increase as dead fuels continue to build up on the forest floor and ladder fuels continue to grow in the understory. Should a large fire event occur within the project area, OHV riding opportunities would be unavailable to the public for a short period of time during the fire event and possibly for a short time after as road hazards are mitigated. Any increase in illegal OHV use would increase the potential for erosion and weed spread throughout the burned area. There is no non-designated OHV trail system in the project area.

Dispersed Recreation

No immediate change would occur in the quality of the dispersed recreation opportunities, including camping, in the project area if the No Action alternative is selected. The availability of dispersed recreation opportunities (boating, fishing, swimming, picnicking, berry picking, hunting, firewood gathering, sightseeing, snowmobiling, Nordic skiing, snowshoeing, hiking, stock use, and mountain biking) would remain the same and the setting in which those opportunities exist would remain reasonably unaltered in the foreseeable future. Over time, however, the lack of treatments (thinning, shaded fuel breaks, commercial harvest, underburns) to existing stands may lead to a loss of scenic vistas and overstocking of the understory/overstory trees, making cross-country travel difficult (especially as these trees die and start to jack straw) and crowding out other plant species such as berries and flowering shrubs that wildlife and humans enjoy. This situation could reduce the availability of certain dispersed recreation opportunities (those requiring forest access such as: hiking, fishing, hunting, berry picking, snowshoeing, etc.) and decrease the level of satisfaction recreationists experience while participating in those dispersed recreation activities.

Over time, however, the likelihood of a large fire event would increase as dead fuels continue to build-up on the forest floor and ladder fuels continue to grow in the understory. Should a large fire event occur within the project area, dispersed recreation opportunities would be lost during the duration of the fire. In many cases, these opportunities (berry picking, hunting, firewood gathering) would be lost until the landscape was capable of supporting the plant species required for the specific dispersed recreational activities. Other opportunities (sightseeing, picnicking, and cross-country travel) would experience a short-term negative impact resulting from the visual degradation of the setting. In the long-term, these same activities may benefit as the landscape transitions over several years from ash, to flowers/forbs, to brush, then back to forest.

Potential Wilderness Areas

There are no potential wilderness areas within the East Wedge planning area.

Visual Quality

The existing visual condition of the East Wedge planning area ranges from a landscape where changes are not visually evident to the average person unless pointed out, to landscapes where changes are noticed by the average forest visitor, but they do not attract attention. The natural appearance of the landscape dominates. Under the No Action alternative this situation would remain in the short-term. Over the long-term vegetation would continue to encroach into meadows and other openings. If the increase in fuel levels results in a wildfire, views would change to more open conditions with residual blackened trees and down material. This situation would still reflect ‘natural’ processes, but may not be desired scenery for some forest visitor’s.

Special Uses

There are seven existing special use authorizations and two pending authorizations located within the East Wedge project area. In addition there are numerous mining claims within the project area. Since no activities would be implemented under the No Action alternative, there would be no effect to special use authorizations.

Cumulative Effects

The cumulative effects of taking no action depend in part on climatic trends and activities surrounding the planning area. Climate change may influence distribution of biophysical environments and their fire regimes, though how this would affect the planning area is hard to predict. The outcome of no action is the loss of economic value both in terms of timber and stand conditions for maintaining or improving structural stages.

EFFECTS OF THE PROPOSED ACTION AND ALTERNATIVE C

Fuels, Fire, and Forests

Introduction

The fuels reduction of the East Wedge proposed action is based on priorities identified in the Stevens County Community Wildfire Protection Plan (SCCWPP which identified the WUI). The Canadian Border Zone (CBZ) was treated as a WUI because of its proximity to the Canadian border and the desire to protect this area as if it were a border to other properties. The analysis laid out in this chapter and the associated Fuels Assessment and Silvicultural Reports (see Strand 2011 and Kaney 2011 in the project analysis file) focus on the existing environment and environmental consequences within the context of the following indicator measures:

1. The number of acres treated within the WUI and CBZ to move towards fire regime condition class 1.
2. Acres/miles of treatments along major access and egress roads improved for fire fighter and public safety.
3. Decrease the probability that a future wildfire would develop into, or be sustained as, a stand-replacing or crown fire

Best available science was considered and used in analyzing the effects of proposed treatments. Scientific information relied on is incorporated and cited in the discussion of effects. The spatial scale of analysis for direct, indirect and cumulative effects varies for each indicator measure. Treatments would have no effect on forest density and structure and fuel loads outside of the treatment area, though it is anticipated that treatments would reduce the risk of wildfire moving from NFS lands to adjacent private and state lands.

Alternative C is the Proposed Action with the following changes: 1) It would not construct any new system roads. 2) Some stands were re-delineated to reflect the decrease in construction of new system roads for harvest. 3) No new stands were added. 4) It changes the authorized use of Forest road 1500 from Open to Highway Legal Vehicles to Open to all Vehicles. These changes reduce road reconstruction by 0.8 miles, decrease the acres of prescribed fire by 159 acres, decrease fuelbreaks by 52 acres, and decrease thinning by 690 acres .

Data Collection

The existing condition of the vegetation and fuels was determined by 104 stand exams in commercial-sized stands conducted according to Forest Service VEG protocol (USDA Forest Service 2006a), aerial photo interpretation, and analyzing annual aerial insect and disease survey flights. The planning area was analyzed to determine the extent and placement of plant associations and subsequent biophysical environments and associated fire groups, fire regimes, forest stand structure, fuel models and parameters, and current insect and disease populations and potentials.

Stand exams taken in 2010 provided data for about 16 percent of the forested land (NFS land only) within the planning area. Because stand exam data was not available for all stands within the planning area, each forested stand was tied to a similar stand for which stand exam data existed. The determination of like stands was based on stand walk-through examinations and aerial photo review. For some stands, comparable stand data did not appear to fit their conditions (i.e. more open and rocky). These stands were grouped by likeness and then assigned a value for the indicator measures based on site visits and/or reviewing the stand attributes of other dry, open stands.

Background/Existing Condition

Vegetation

Forest structure (size and arrangement of trees) in the planning area has changed over time from stands dominated by large trees in multi-storied conditions to overstocked multi-storied stands of small trees and more uniform stands of smaller trees. These changes largely occurred due to historic forest practices, fire suppression, and insect- and disease-caused mortality.

Fire suppression reduced the natural tree thinning action of fire in the planning area, resulting in denser forests. Trees growing closely together are in direct competition with each other for light, water, and nutrients so the trees become less vigorous and more vulnerable to insects and diseases. The resulting increase in insect and disease caused tree mortality adds to the already heavy fuel load.

Increased surface fuels have created a more contiguous horizontal fuel bed which aids in the spread and intensity of fire. The ladder fuels have caused greater vertical continuity, allowing a surface fire to climb into the crowns of the trees. Because the overstory canopy has dense crowns that are close together, the risk increases for the movement of fire from tree to tree (active crown fire).

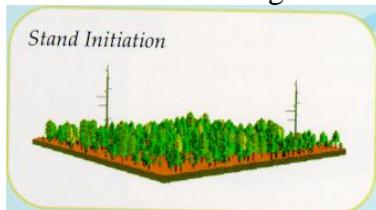
The desired future condition includes reducing the risk for spread of insect, diseases or fires from NFS lands onto adjacent landowner’s property along the WUI.

Structural Stages

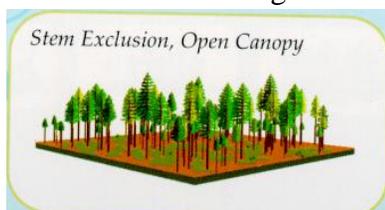
Structural stages are a way to look at timbered landscapes and help understand how the stands are developing and what stage of development they are in. This further aids analysis and decisions on how to change and restore the landscape to more sustainable conditions. One of the most important components is the Late and Old Structural Stage (LOS). Approximately 10 percent of the forested area is currently LOS. Historically, LOS stands occupied a greater portion of the forested area.

The desired condition of all biophysical environments would be a distribution and abundance of structural stages within the historical range of variability (HRV). HRV is not a target condition, however, it definitely influences prescription choices. For instance landscapes generally lack enough LOS regardless of the biophysical environment. The Eastside Screens require that stands be harvested such that stand development leads to LOS. The East Wedge planning area is currently below the HRV for LOS in all biophysical environments and treatments need to move the respective stands to LOS. Although LOS has many attributes, the primary criteria is 8 trees per acre, 21 inches diameter and larger. Table 11 identifies the existing condition of the East Wedge Planning Area in terms of percentages of area in each structural stage.

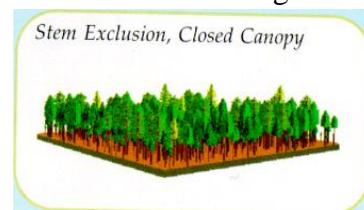
Forest Structural Stage 1



Forest Structural Stage 2

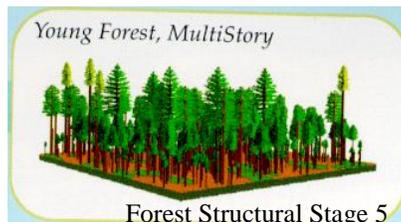
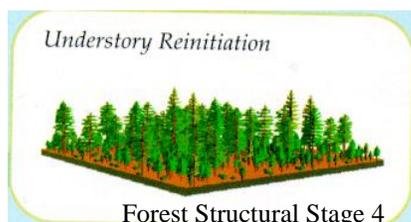


Forest Structural Stage 3



Stand Initiation through Stem Exclusion (Stages 1-3): These early stands are fully stocked by conifer trees that may range in size from seedlings through 15” diameter trees. The distinguishing characteristic is that all the trees are near the same age (same cohort), and all the trees are in the same canopy layer. A second canopy layer of shade tolerant trees has not yet started to develop in the understory.

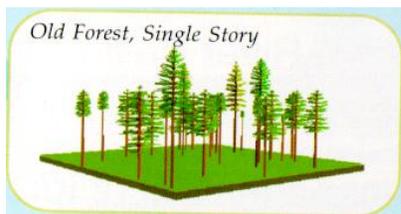
Understory Reinitiation and Multi-Stratum without Large Trees (Stages 4 & 5):



A second cohort of trees is established under an older overstory in these middle stages. Openings start to appear in the canopy, and the amount of down wood increases. The trees in the overstory are typically early seral (western larch, pine, Douglas-fir, etc.) while the trees in the understory are typically shade-tolerant (grand fir, western red cedar, etc.). The stand may contain many sizes of trees, but large trees are uncommon.



Multi-Stratum with Large Trees (Stage 6): These late and old stands contain two or more cohorts of trees, and trees in a variety of sizes are present. The overstory canopy is discontinuous, and dominated by large trees.



Single-Stratum with Large Trees (Stage 7): A single layer of large seral trees is present in this late and old stage. The understory may be absent or may contain sparse or clumpy seedlings and saplings. These stands may be called by some “park-like.”

No commercial activities are proposed within Structural Stages 6 or 7.

Old Growth

The analysis consisted of Region 6 stand exams on about 25% of the East Wedge area and walk through stand examinations on a portion of the area. Eighty-four (84) late old structural stands (LOS; Stages 6 and 7) were analyzed. As designated by the Regional Forester in a letter dated December 3, 1992, and by the Forest Supervisor in a letter dated April 5, 1993, the planning area was analyzed using the North Idaho Zone definitions for old growth stands (NIZOG). One Stand was identified as old growth within the analysis area and currently meets the North Idaho Zone definition for old growth. Portions of stands 2440077 and 2440080 contain an area greater than 10 acres that would be considered old growth. All stands proposed for mechanical treatment have been walked and are not old growth. There may be more stands in the planning area that would meet the criteria NIZOG, but they have not yet been identified.

Direct and Indirect Effects

The Proposed Action and Alternative C would reduce tree density and inter-tree competition resulting in increased forest vigor and improved resistance to insect and diseases. This would help to move the landscape condition back to one of “fire resilience.” Thinning from below would move multi-storied stands with large trees toward single-story stands with large trees, conditions more reflective of historic structure. Consistent with the Eastside Screens, there would be no net loss of forest structure with large trees. Thinning in dense stands without large trees would reduce inter-tree competition and speed the rate at which smaller stands grow into large tree dominated stands.

The proposed treatments would result in less severe effects from an insect outbreak and existing diseases such as dwarf mistletoe and *Armillaria*. This is due to the treatment of stands meeting the criteria for improvement as set forth in the Purpose and Need.

All regeneration harvests are planned so that after final removal, all sites would achieve minimum stocking or better within five years. Plantations planted before 1995 that are at least 4 ½ feet tall are free to grow and meet the prescribed stocking levels to achieve the LRMP objectives so these plantations would no longer be considered openings.

The effects of precommercial thinning treatments (approximately 2,759 acres) would not be realized for at least one decade and more likely 3-4 decades as these stands move from structural stage to 1 to structural stage 4. The thinning of these old regeneration harvest units would contribute to maintaining early seral species, controlling stocking and improving tree growth. However, the thinning would temporarily create a fuel bed that would readily carry a fire. This would be mitigated by either hand piling strategic locations, mitigating treatment areas along open roads or not treating portions of these stands. No mechanized harvesting equipment would be used on these sites so soil disturbance should be zero to close to zero.

Table 10. Comparison of Alternatives for Over-stocked and Insect Infested Stands

	No Action Alternative	Proposed Action	Alternative C
Acres of young trees thinned	0	2,759	2,759
Acres of overstocked stands treated (total available = 13,041 ac)	0	6,390 (49%)	5,534 (42%)
Acres treated that have existing insect damage (7,101 acres identified)	0	2,223 (31%)	2,023 (28%)
Bark Beetles (6,714 acres identified)	0	2,163 (32%)	1,963 (29%)
Defoliators (65 acres identified)	0	15 (23%)	15 (23%)

Table 11. Biophysical Environment--Structural Stage Matrix after Treatment

Structural Stage	Biophysical Environment			
	Time Frame ¹	Warm Dry Psme Shrub (Groups 2,3,4)	Cool Mesic Psme-Abgr Forb-Shrub (Group 5)	Cold Mesic Tshe-Thpl-Abla2 Forb-Shrub (Group 7&11)
Early Stage 1, 2, 3	H	10-25%	15-35%	5-30%
	C	28%	29%	20%
	PA	28%	30%	21%
	AC	28%	30%	21%
Middle Stage 4, 5	H	10-25%	20-50%	10-50%
	C	63%	*62%	*69%
	PA	63%	*61%	*68%
	AC	63%	*61%	*69%
Late and Old Stage 6	H	5-20%	20-30%	30-70%
	C	6%	*4%	*10%
	PA	5%	*3%	*10%
	AC	5%	*3%	*10%
Late and Old Stage 7	H	30-75%	10-25%	NA
	C	3%	*4%	-
	PA	3%	*5%	-
	AC	3%	*5%	-

¹H = Historical Range

C = Current Condition (No Action Alternative)

* = Denotes currently outside of the Historical Range of Variability

PA = Proposed Action Alternative

AC = Alternative C

Intra-stand species diversity would remain intact, given the species mosaics formed as a result of the fires of the 1920s. However, intra-stand species diversity could decline in some stands where lodgepole pine is targeted for removal.

The Proposed Action and Alternative C would break up stand continuity and improve the opportunity to limit the size of severe wildfires. Under the Action Alternatives, thinning of overstocked stands and treatment of 32 percent of the stands infested with bark beetles is expected to increase the acres of LOS in the future more quickly than the No Action Alternative.

Biophysical Environment

The change in early, middle, and late old structural stages (SS) changes are hard to measure at this scale with the proposed treatments. Most treatments move stands from structural stage 5 to structural stage 4 or the treatments improve the health of structural stage 3 or 4. Table 11 shows the three biophysical environments where change would occur. There was a small increase in the early stage of 239 acres under the Proposed Action and 203 acres under Alternative C as stands in the middle stage received regeneration harvest treatments.

In the Warm Dry Psme Shrub BPE (Groups 2, 3, 4) there was a shift of 54 acres and Cool Mesic Psme-Abgr Forb Shrub BPE (Group 5) and there was a shift of 70 acres of LOS from SS 6 to SS 7 through the use of prescribed fire to kill the understory and create more open park-like stands. This results in no net change of LOS.

Fire exclusion, lack of high frequency, low severity fires, and the lack of intermediate treatments including harvest has created a situation where species mixes favor fire-intolerant species, and has helped increase stand densities, insect and disease risk. This has and would continue to be the reason for being below HRV in LOS stands. The late 1990s bark beetle outbreak has also contributed to the loss of SS 6 and 7 stands throughout the planning area. Future treatments are designed to continue to move stands in SS 1, 2, 3, 4, 5 to SS 6 or 7 as quickly as possible.

Ingress/Egress

The scale of analysis includes fuel conditions along approximately 25 miles of key roads within the East Wedge boundary that are important to ingress and egress, and 1.5 miles of private property boundaries. Beyond this scope, the effects of miles of defensible space treatments are not considered to be quantitatively or qualitatively meaningful. Miles of defensible space along roads and private property boundaries include all proposed mechanical and non mechanical fuel treatments, including, but not exclusive to, canopy, ladder and surface fuel treatments.

Existing Conditions

Treatments along key roads within the Forest boundary and percent of those treatments that are fuel breaks are identified in Table 12.

The fuel conditions along these roads are generally represented by dense canopy or ladder fuels with moderate surface fuel loadings. Should a larger wildfire event occur and threaten to spread along or across these roads, most of them would be unsafe to travel and ineffective as fire breaks to help stop fire spread.

There are approximately 1.5 miles of private land boundaries with nearby residents and structures within and adjacent to the East Wedge project. Additionally, there is one critical infrastructure identified in the WUI; the communication site located adjacent to Flagstaff Lookout. A small campground is also in the project area. Both treatment alternatives would address the lookout and campground.

Direct and Indirect Effects

Canopy, ladder and surface fuel treatments are proposed to occur along and near many of these roads, property boundaries, campground and communication site to provide defensible space, which is intended to provide more time, safer access, and improved suppression opportunities for firefighters during a fire event. In the absence of larger fuel treatment units (as is the case in some stretches along the key roads and property boundaries,) canopy, ladder and surface fuel treatments along roads would allow these roads to be used as secondary evacuation routes for Forest users, depending on fire behavior, extent, and location.

Table 12. Key Roads for Ingress and Egress

Road Number/Name	Miles in project	% with proposed fuel treatments	% with past fuels treatment	Comments
Churchill Mine County Road	4.5	70%	20%	Primary east-west route in middle of project area.
1500000 (1500)	9.5	45%	30%	Additional east-west primary route through project area
1520000	4.5	55%	25%	Flat Creek road, enters from south and connects with Church Hill Mine Road
1500960	2.5	100%		Flagstaff Lookout Road
1500460	3.5	30%	25%	North access to American Fork of Big Sheep Creek
Total	24.5			

Treatments in the Proposed Action and Alternative C would address the Purpose and Need associated with ingress and egress as identified in the introduction to this section. Suppression action would be less hazardous for firefighters in these areas and would provide greater opportunities for indirect and direct suppression methods. The effectiveness of aerial suppression would be enhanced, and the need for fireline construction would be lessened as roads could be used more effectively as fire breaks.

Secondary ingress/egress routes would be more readily available and reliable for safe evacuation of Forest users. These routes would also provide for safe and more effective access for firefighters engaging in suppression in the WUI. Fuel treatments along private property boundaries would further the defensible space of any fuel treatment being conducted by landowners.

Fire Types

Introduction

The scale of analysis includes the acres within the planning area that are NFS land. Management activities can affect fire severity and type by altering fuel conditions and species composition. Acres outside of the proposed treatment units but within the project area were

analyzed for fire type to gain an understanding of how fire type would be affected both within and outside of treatment units. Beyond this scope, the effects of the treatments on fire type are not considered to be quantitatively or qualitatively meaningful.

Methodology

Farsite, FlamMap, Fire Family Plus, and Behave Plus computer models were used to predict wildfire types utilizing stand exam data which was representative of all biophysical environments and fuel models found in East Wedge project. Further aerial photo interpretation, ground reconnaissance, biophysical environments and historic fire regime comparisons of like stands, and fuel data collection aided in making interpretations and professional judgments on wildfire type throughout forested acres of the project area. Weather and fuel moisture values used were based on both 90th and 97th percentile conditions. These percentiles were selected because fire managers utilize them to determine fire danger for pre-suppression planning purposes and fire preparedness (National Fire Danger Rating System website 2009).

The percentile weather and fuel conditions were determined by analyzing 26 years (using four month fire seasons) of weather data from the Lane Creek Remote Automated Weather Station (RAWS) located in the Sherman Creek Watershed southwest of the East Wedge project area. This weather station is the most representative for fuel moistures, temperature and relative humidity. The Kettle Falls RAWS located just south of Kettle Falls along Lake Roosevelt is the most representative site for winds.

To better understand percentile weather and fuel moistures:

- At the 90th percentile – 10 percent of the days on average of the 4 month annual time frame would be warmer and drier than the fire weather which is represented at the 90th percentile. For example, in an average 100 day fire season, 10 days would typically be at or above the 90th percentile.
- At the 97th percentile – 3 percent of the days on average of the 4 month annual time frame would be warmer and drier than the fire weather which is represented at the 97th percentile. For example in an average 100 day fire season, 3 days would typically be at or above the 97th percentile.

Existing Conditions

During the past century, fire suppression has contributed to heavy ground and ladder fuel conditions, and increased over-stocked stands in much of the East Wedge planning area. As these hazardous fuels have increased over time, the potential for high intensity stand-replacing fires (or crown fires) also increased. Wildfires are becoming increasingly expensive to suppress, dangerous to firefighters and members of the public, threatening to wildlife habitat, water quality and quantity, recreational use, and adjacent property. There is a need to begin reversing this trend by reducing hazardous fuel levels.

Two areas within the planning area are of primary concern. The area identified in the SCCWPP as WUI is a priority for wildfire protection. Fires within the WUI have a strong probability of crossing into adjacent lands and burning properties and structures. The border between the US and Canada has unique fire suppression considerations. Suppression of wildfires must take into consideration diplomatic agreements for access across borders and cooperative firefighting

efforts. Fire suppression would continue to be the first response to wildfire within the SCCWPP and CBZ. Response by fire fighters and members of the public needing to get into or away from wildfires requires safe travel routes. Within the planning area, there are about 25 miles of main travel routes that contain, in some areas, dense forested areas that pose a hazard for travel. In an effort to reduce the risk to fire fighters and members of the public, sections of these routes need fuels reduction activities to reduce the intensity of a wildfire approaching these ingress and egress avenues.

Surface fires—fires that spread on the ground and do not burn into or spread through tree crowns. Although fire severity can be significant and fire control can be challenging, most of these fires are successfully suppressed by initial action of ground resources.

Crown fires—(both passive and active). Passive crown fires are those that spread primarily on the ground, but do torch out single or groups of trees and can lead to crown fire initiation. These fires have potential for spotting (fire brands lofted outside of the main fire perimeter that ignite new fires) and can present control difficulties. Passive crown fires are not atypical, however, and often are suppressed successfully during initial action by ground crews if response times are not delayed significantly.

Active Crown fires—include both crown fire that originates and is sustained in the stand (active) and crown fire that moves into the stand from adjacent stands (conditional). Active crown fires spread extensively through the tree canopies before dropping back to the ground. These fires exhibit rapid spread rates, intense fire behavior, and are prone to long range spotting. They present great resistance to control actions and high risk to the public and firefighters.

Direct and Indirect Effects

In Tables 13 and 14 wildfire potential outputs are shown as a fire type with a corresponding percentage of 49,318 acres analyzed within the project area and modeled using Farsite and FlamMap programs.

Table 13. Summary of Potential Surface Fire and Crown Fire Acres at 90th%*

Alternative	Surface Fire	Passive and Active Crown Fire
No Action		
Acres	25643	23670
Percent	52%	48%
Proposed Action		
Acres	31560	17753
Percent (net change)	64% (+12)	36% (-12)
Alternative C		
Acres	31067	18246
Percent (net change)	63% (+11)	37% (-11)

* Does not include effects of precommercial thinning. Table reflects comparison to entire project area. Acre totals vary slightly due to mapping software.

Table 14. A Summary of Potential Surface Fire and Crown Fire Acres at 97th%*

Alternative	Surface Fire	Passive and Active Crown Fire
No Action		
Acres	23670	25643
Percent	48%	52%
Proposed Action		
Acres	29589	19725
Percent (net change)	60% (+12)	40% (-12)
Alternative C		
Acres	29589	19725
Percent (net change)	60% (+12)	40% (-12)

* As modeled in FlamMap and when compared to entire project area. Does not include PCT.

The existing fire type potentials are not unexpected under the current fuel conditions and relative to the generally steep and complex terrain that characterizes much of the project area. Crown fires are not atypical events; they are more likely to occur where fuels have not been treated. Of the 49,318 acres – including non-NFS lands - in the project area, proposed mechanical and non mechanical fuel treatments **would decrease crown fire potential by 11% (alternative C) or 12% (proposed action) under 90th percentile conditions,**

Crown fire is the highest under the more extreme weather and fuel conditions represented at the 97th percentile. **Post fuel treatments indicate both action alternatives would result in approximately 12% fire type decrease** over the no treatment alternative and would achieve measure #3; decreasing the probability that a future wildfire would develop into, or be sustained as, a crown fire.

Fire suppression effectiveness would be improved in the WUI and CBZ as fire types are altered to more manageable circumstances. Ingress and egress would also be improved as a result of treatments along major routes. The changes in fire type are in direct correlation to the completion of fuel treatments:

- Surface fuels, existing dead-down and post harvest slash, would be reduced through prescribed fire, machine piling, hand piling and pile burning. This reduces the fire type, intensity and rate of spread of wildfire.
- Ladder fuels would be reduced in process of harvest and underburning. This would raise the canopy base height making it more difficult for crown fire to initiate. Canopy bulk density would be reduced through the various harvest treatments, which would space the tree crowns apart making crown fire more unlikely.
- Crown fires and spot fires would be less likely to originate from NFS land and spread to adjacent properties. NFS lands would also be less likely to sustain a crown fire approaching from non federal ownerships outside the project area. Fire suppression in

the WUI and the CBZ could be attempted with greater success by ground forces. Air resources could more easily suppress fires where timbered canopies have been opened up to allow aerial retardants and water to penetrate to the ground.

- Prescribed fire smoke would affect air quality, but adherence to the standards and guidelines in regards to smoke emissions, as managed by the Washington State Department of Natural Resource Smoke Management Program, would be met.

Successfully completing the variety of fuel treatments proposed in the project area would change predicted type of fire. Although those changes may not insure total protection of privately owned structures, the proposed fuels reduction would greatly reduce the likelihood of long range spotting occurring from the treatment units. Experience has shown thinning and prescribed fire target different components of the fuel-bed of a given forest stand and landscape (Peterson et al. 2005).

Commercial and non-commercial fuels treatments would raise the average canopy base height by thinning from below to reduce horizontal and vertical canopy continuity. Underburning would also scorch the lower live limbs and help raise canopy base height. There would be an increase of canopy base height to around 15-20 feet. This would also have an effect of reducing the overall canopy bulk density. By increasing average canopy base heights, surface fires would have a greater tendency to stay on the ground and not ignite the tree canopies. Horizontal canopy continuity would be reduced by reducing canopy bulk density thus crown fire potential and sustainability. The strategic placement of fuel treatments further inhibits the possibility that crown fire would be sustained throughout the project area (Finney 2004).

Concern exists for the amount of downed wood left for other resource needs. Design Elements (Appendix C) include retention of large wood to serve as nutrient and moisture storage and wildlife habitat components. This would not have an impact on fire type.

Wildfire has a bigger impact than prescribed fire activities. The resource damage and disturbances that occur on large wildfires include emergency fireline, safety zone, and road construction. Prescribed fire activities sometimes necessitate firelines and other disturbed areas but these impacts are typically less than those created by wildfires because of the ability to develop prescribed fire plans.

In both the Proposed Action and Alternative C, crown fire at both the 90th percentile and at the 97th percentile would be reduced in the project area and this is a measure in the Purpose and Need. These changes in fire type potential would help limit the threat of crown fire spreading from the East Wedge project area to non-NFS lands.

Cumulative Effects

Once the areas are treated, cattle grazing would continue to maintain lower fuel levels by eating the palatable growth. In addition, the timber harvest on adjacent private lands is expected to reduce fuels thus decreasing fire behavior either from or towards NFS lands. Harvests on the Summit Pierre Timber Sale which lies west of the project area would also decrease fuels thus decreasing fire behavior either from or towards the project area. The level of fire behavior

reduction from these activities is unknown because the level of harvest on other ownerships is unknown at this time.

Fire Regime Condition Class

Historically, wildland fire frequently burned in many parts of the project area. In recent decades, the nature of fire on these lands has changed due to fire exclusion and other human activities, such as grazing and timber harvest, and the ecosystems have also changed dramatically. The extent and impact of this change can often be correlated to the fire regime itself. Fire exclusion has more of an impact on the ecology of an area that typically experiences light surface fires every one to thirty years than in areas that have a longer fire return interval. The detrimental effects of fire suppression in these latter regimes would take longer to appear. Old, dense stands, covering a large portion of the landscape in these higher frequency regimes, can dramatically increase the size and severity of wildfires and insect epidemics (Lower Kettle River Community Wildfire Protection Plan, December 2005).

A series of Fire Regime Condition Classes (FRCC) have been developed to describe the extent to which the current fire regime has deviated from normal (historic) for any given biophysical environment. These are based on changes in the species composition, structure, age, and density of a stand and are used to quantify the condition of the land resulting from fire exclusion and other influences (timber harvesting, grazing, insects, disease, and the introduction and establishment of non-native species). This analysis attempts to quantify the extent of the fire management problem and the degree of required restoration and maintenance treatment required. The following excerpts from Hann et al. 2008 describe the three FRCC:

Condition Class 1: Fire Regimes in this condition class are within their natural (historical) ranges. Vegetation composition and structure are intact. The risk of losing key ecosystem components from the occurrence of fire is relatively low. Where appropriate, maintenance management such as prescribed fire and hand treatments can prevent these stands from becoming degraded. Approximately 4% of the East Wedge Project Area is in condition class 1.

Condition Class 2: Fire regimes in this condition class have been moderately altered from their historical range. Fire frequencies have departed by either increasing or decreasing from historical frequencies by one or more return interval, resulting in moderate changes to one or more of the following: fire size, frequency, intensity, severity, or landscape patterns. A moderate risk of losing key ecosystem components has been identified on these lands. To restore the historical fire regime, these lands may need moderate levels of restoration treatments such as prescribed fire and hand or mechanical treatments. Approximately 86% of the East Wedge Project Area is in condition class 2.

Forests in condition class 2 may exhibit moderate increases in density, encroachment of shade tolerant species, or moderate loss of shade intolerant tree species caused by fire exclusion, logging, or insects and disease. Surface shrub/grass may be replaced with woody fuels and litter.

Condition Class 3: Fire regimes in this condition class have been largely altered from their historical range. Fire frequencies have departed from historical frequencies by multiple return intervals, resulting in dramatic changes to one or more of the following: fire size, frequency,

intensity, severity, or landscape patterns. Vegetation condition, structure, and diversity have been highly altered. A high risk of losing key ecosystem components has been identified. To restore the historical fire regimes, these lands may require high levels of restoration treatments such as hand and mechanical before prescribed fire can be utilized. Forests may exhibit high increases in density, encroachment of shade-tolerant tree species, or high loss of shade-intolerant tree species caused by fire exclusion, logging, insects, or disease. Surface shrub/grass may be replaced with woody fuels and litter. (Hann et. Al. 2008). Approximately 10% of the East Wedge area is in condition class 3.

Scope of Analysis

The scale of analysis includes the forested acres within the planning area that are NFS land. Beyond this scope, the effects of the treatments on fire severity are not considered to be quantitatively or qualitatively meaningful. Management activities can affect fire severity by modifying fuel conditions and species composition. Outside of the proposed treatment units, fuel conditions and species composition would not be altered and it is unknown how fire severity may or may not be altered. Holding fire weather conditions constant, fire severity increases with increases in ladder fuels (Jain and Graham 2007), fuel loadings, fire intolerant species (e.g. lodgepole pine, subalpine fir, grand fir, Engelmann spruce), and small trees with thin bark.

Existing Conditions

An assessment of the overall landscape condition class in the East Wedge project area reveals a condition class of 2. Assessment at the stand level indicates that about 96 percent of stands surveyed (and proposed for treatment) were identified as having an FRCC of 2 or 3. Vegetation conditions warrant fuels reduction activities to correct stand conditions.

In the absence of natural fires, many areas have become overgrown with shrubs and smaller diameter trees (saplings and pole-sized regeneration), creating ladder fuel densities that are at risk to more severe and damaging wildfires. This buildup of natural fuels constitutes an additive factor in the intensity of summer wildfires when they do occur, adding to their resistance to control and likelihood of spreading. Accumulated fuels can provide a “fire ladder”, allowing fire to gain access to the crowns of the dominant over-story trees. As ladder fuels increase over time, so does the potential for high intensity crown fires. When burning conditions are ripe as is common in the heat of summer, wildfires burning in such fuel conditions may easily destroy the stand, require high fire suppression costs, and threaten life and property values on neighboring private land. These kinds of fires have become increasingly dangerous for fire fighters and the public, and expensive to fight.

Fire severity affects the post-fire recovery processes. Safford et al. (2009) noted that reducing fire severity provides the ecological benefits of “higher post fire soil litter cover, higher herbaceous plant cover and diversity, and lower levels of red turpentine beetle (*Dendroctonus valens*) attack.” In areas where trees are killed but needles are not consumed by fire, needles can fall and provide ground cover.

Post-fire tree mortality usually continues for three to five years after a fire because fire-injured trees are more susceptible to insects (primarily bark beetles) and drought. The extent of post-fire

mortality is linked to the vigor of trees prior to a fire. Hood et al. (2007) found that dense stands have trees with reduced vigor that are more susceptible to post-fire mortality caused by bark beetles.

Direct and Indirect Effects

Table 15 shows a comparison by alternative of the number of acres of all treatments in FRCC 2 and 3. In the Proposed Action and Alternative C, the treatments would move fuel levels within the WUI and CBZ towards a FRCC 1.

Table 15. Fire Regime Condition Class

Fire Regime Condition Class	No Action	Proposed Action	Alternative C
FRCC 2	0	13,369	12,487
FRCC 3	0	1,069	1059
Total Acres	0	14,438	13,546

The proposed treatments would reduce moderate and high severity fire for 90th and 97th percentile weather conditions by: 1) reducing surface, ladder and canopy fuels, and 2) shifting the species composition toward fire-tolerant species and reducing crown fire potential. Under 90th percentile weather conditions, it is predicted that the proposed treatments would reduce potential crown fire activity by about 40% when comparing before and after on just the proposed treatment acres. Under 97th percentile weather conditions, it is predicted that the proposed treatments would reduce potential crown fire activity by about 44% when comparing before and after on just the proposed treatment acres, and indicates that measure #3 would be met with either action alternative.

In the short term, there would be less surface fuel and, as a result, there would be less heat transfer to cause cambium kill and scorch. Additionally, there would be fewer ladder and canopy fuels, thereby keeping fire out of tree crowns and causing direct mortality from canopy consumption. The retained trees would be the largest and most fire tolerant and they would respond to treatments by increasing bark thickness, allowing these trees to become more fire tolerant. Within 20 to 30 years, these effects of the treatments would continue to provide for reduced potential fire severity when compared with the No Action Alternative.

The indirect effects of the Proposed Action or Alternative C upon the future stand structure of treated stands within the planning area may not be realized for decades. It is expected that treatments would result in stands reaching late structure multi- or single strata sooner than if the stands were left untreated. This is partially due to increased growth rates of residual trees caused by thinning to reduce competition within the stands. It is also due to reduced mortality in treated stands because many of the diseased and infested trees are removed during treatment. The maintenance and improvement of vigor of seral species within stands throughout the planning area should aid in improved health, growth, and disease resistance. These changes are expected to move the stands to conditions more resilient to large stand replacing fires in the long run.

Inter-stand species diversity would remain intact, given the species mosaics formed as a result of the fires of the 1920s. Intra-stand species diversity could decline in some stands where lodgepole pine is targeted for removal. Treatment of some stands by removal of some of the insect-and-disease-susceptible overstory (notably Douglas-fir, grand fir, and lodgepole pine) should reduce the probability of increased forest health problems for many years. Healthy seral species trees such as western larch, ponderosa pine, western white pine, birch and aspen would be favored as leave trees in most situations.

Cumulative Effects

When added to the proposed action, there are no ongoing or reasonably foreseeable future actions that would have a measurable effect on fire severity in the planning area. However, the timber harvest on adjacent private lands is expected to reduce fuels thus decreasing fire behavior either from or towards NFS lands. The fuel reduction treatments occurring within the East Wedge project area, combined with the fuels reduction in the Summit Pierre project area immediately west would reduce uncharacteristic wildfire risk in the Pierre Lake area. Risk would also be lessened to the other homes and private properties adjacent to the project area.

No timber harvest is planned under any alternative in any riparian areas (RHCA). This meets the intent of INFISH and the LRMP and would result in no cumulative effects to these resources.

There is an awareness of increasing unauthorized, motorized recreation use, as well as illegal taking of forest products (mainly firewood theft). The implementation of the defensible space treatments along these identified ingress/egress routes could further the occurrence of these activities.

Roads

Introduction

A road analysis was conducted by the East Wedge Interdisciplinary team (IDT) wherein roads in the planning area were assessed individually to determine if existing roads are needed or not needed and to document resource risks. This list was used to generate the draft list of roads proposed for decommissioning and identify objectives and long-term needs in the planning area. The following is excerpted from the Transportation Specialist report located in the project file (Cornwall 2012).

Data Collection

The INFRA-Travel Routes of the mapped transportation layer was queried in June 2010. A field review completed in fall 2009 was also referenced during the office review. The majority of the existing roads were field reviewed to determine existing conditions and identify deficiencies. Many additional existing unauthorized and non-system roads were identified from aerial photos and during field review of the project area. Using the information from the field review, recommendations have been developed and included in the GIS project analysis transportation layer and transportation report.

Direct and Indirect Effects – Proposed Action

Based on a query of the INFRA-Travel Routes of the mapped transportation layer in June of 2010, there are approximately 180 miles of roads in the East Wedge Project Planning Area. This total includes all roads within the INFRA system on all lands, although it is known additional roads exist on private and Washington State Department of Natural Resources lands. This total does not include unauthorized or non-system roads except where previously mapped and entered into the system. The roads in this category were unplanned and may be the result of past resource extraction (temporary roads), homesteading, or user created roads.

Unauthorized roads are not intended to be, and are not managed as, the Forest transportation system. Unauthorized roads include unplanned roads, off-road vehicle tracks, and abandoned travel-ways (36 CFR 212.1). There may be more unauthorized roads in the planning area that are not mapped, and may be discovered upon project layout. These would be used in lieu of creating new skid trails or temporary roads if deemed feasible.

New System Roads (approximately 5.9 miles)

The term “construction” is used within this analysis to describe activities necessary to develop a usable linear road segment with an acceptable roadway template based on the site and anticipated use where a NFS road does not currently exist. The roadway template would be identified by the design engineer utilizing the USFS Handbook 7709.56. The only exceptions within this analysis are temporary roads described in a later segment and segregated from roads recommended to remain as system roads after project implementation. Within the project area, 5.9 miles of road construction are recommended to facilitate the treatment of stands identified within the proposed action.

All new system road construction would be closed to traffic after harvest, administrative, and other associated treatments such as prescribed burning. The roads would be blocked (earthen berms, ditches, or boulders) or gated but not decommissioned. The closure device would be in agreement with the anticipated maintenance interval. It is recommended to remove all culverts unless regular monitoring and maintenance is anticipated. These are roads deemed needed for long-term management and are intended to serve multiple use needs as a long-term facility. They would be periodically maintained; frequency and degree of maintenance depending on the assigned maintenance level and available funding. New system roads are managed and tracked on the corporate database Infra-Travel Routes.

Table 16. Specified Road Construction and Units Accessed in the EW Project

Road Segments	Length (miles)	Est. Cost	Polygons Accessed
444	1.9	\$49,368	2450015, 2450016, 2450021
446	0.2	\$4,224	Mainline Road Relocation
528	0.2	\$6,336	2390009, 2390008
561	1.3	\$35,112	2480105, 2480104, 2480065, 2480061, 2480051
562	0.2	\$5,280	2480038, 2480043, 2480046
564	0.1	\$3,432	2440169, 2440158
565	0.4	\$10,560	2440127, 2440132, 2440128
566	0.5	\$12,672	2440132, 2440135, 2440127
573	0.6	\$15,840	2440174, 2440164, 2440163
575	0.3	\$7,656	2480047, 2480053
620	0.2	\$5,544	2440161, 2440154
Total	5.9	\$156,024	

All system roads proposed to be constructed would be traffic service level D (single-use, not designed for mixed traffic), functional class - local, with an intermittent service life unless otherwise noted. Design vehicle for all roads would be a log truck. The critical vehicle would either be log truck or yarder depending on the logging system planned for use in treatment of the units the road is accessing.

Road design and location would be such that the roads have a “free-flowing” alignment and “rolling” grades. The goal of these strategies is for the road to match existing topography thus minimizing excavation. Rolling drain dips constructed into the new roadway sub-grade would be used to shed water off the roadbed at regular intervals to minimize erosion. New specified road construction would follow Best Management Practices (BMPs) listed in Appendix E. All planned specified construction would be re-evaluated at time of layout as to its need to be built as “specified” or “temporary”. Specialist input would be sought for help in this decision making process.

None of the proposed new roads would provide direct access to private land, though some would be built within 0.1 miles of it. As previously stated, it is Forest policy to close all new system roads with an effective barrier upon project activity completion. Under the proposed action, the new roads would be monitored for two years following road closure. Unauthorized use of these roads would be noted and barriers adjusted as needed to prevent access.

Temporary Road Construction (approximately 3.8 miles)

Some temporary roads would be constructed under the proposed action. The term “temporary” is a Forest Service Timber Sale Contract term used to define those roads to be constructed by the timber purchaser for the sole purpose of treating a specific unit. The intent of these roads is to use them for the short-term only, after which they would be closed, effectively obliterated,

seeded, and put back into resource production within 10 years of contract completion. Effective obliteration is generally achieved through a combination of these measures:

- Temporary culverts and bridges are removed and the natural drainage configuration is reestablished.
- Road surface is ripped below the level of compaction.
- Side-slopes are reshaped and stabilized.
- Road is effectively drained and blocked.
- Road is returned to resource production through re-vegetation (grass, brush, or trees).

Since temporary roads are not intended to be a long-term facility, they are not tracked on the Infra-Travel Routes database. Their location is determined by agreement between the timber purchaser and timber sale administrator. Since these roads are intended to serve a specific harvest unit only, long-term access needs are not generally given consideration. The cost of this temporary construction is included in the cost associated with the logging of the unit it accesses. Table 17 displays the estimated lengths and the polygons accessed by each temporary road.

As per Colville Supplement 2400-96-1, the roads that can be considered for temporary construction are those that generally meet the following standards.

- Short term, single purpose road needed for one project or resource activity.
- Road would not be used in the next twenty years.
- Difficulty of construction is low with an acceptable level of resource impact. The road has little or no rock blasting, located on flatter side slopes, and no need for tight control of construction or location. No special design standards are needed for construction such as special sediment reduction methods, low bed access, aggregate surfacing, drain dips, or large culverts/bridges.
- Length is generally less than 0.5 miles.
- Road is not expected to be extended in future entries.

Those roads currently planned as temporary construction would be assessed during project implementation and its category adjusted as needed. Any roads planned for specified construction may shift to temporary based on field conditions and specialist input provided at time of layout. Approximately 3.8 miles of temporary road are planned for construction in the proposed action.

Table 17. Temporary Road Construction and Units Accessed in the EW Project

Road Segment	Length (miles)	Est. Cost	Polygons Accessed
523	0.2	\$1,400	2390047
526*	0.3	\$2,600	2390004
531	0.1	\$900	2430180
532	0.1	\$500	2430166, 2430140
580	0.4	\$3,000	2470176, 2470173
581	0.3	\$2,000	2470173, 2470167
582	0.2	\$1,850	2440086
586	0.1	\$700	2390055
587	0.8	\$5,800	2390055
596	0.3	\$2,000	2490052
602	0.1	\$700	2470180, 2470172
614	0.2	\$1,400	2390049
1000	0.5	\$3,900	2390056, 2390058
1001	0.2	\$1,875	2400013
Total	3.8	\$28,625	

* Temporary road construction on existing unauthorized road bed.

Road Reconstruction (approximately 61.8 miles)

The term “reconstruction” is used within this analysis to describe activities necessary to utilize a road segment beyond the scope of maintenance typically performed on a regular schedule (i.e. drainage structure replacement and installation, clearing and grubbing, reestablishment of sub-grade template and curve widening). Some of these activities are directly related to deferred maintenance in the past, but constitute a larger capital investment to return the road segment to operational status for the treatment activities than maintenance as described in the following segment. Specific work items for road reconstruction would be determined during the layout or presale phase of implementation of this project. Within the project area, approximately 61.8 miles of existing road are recommended to be reconstructed to facilitate the treatment of stands identified within the proposed action.

Road Reconstruction is defined as an activity that results in improvement or realignment of an existing classified road. Three types of road reconstruction are proposed in the proposed action; light, medium and heavy.

Light - Light reconstruction of a specific road is sometimes referred to as “spot reconstruction” because it may occur in “spots” not on the entire length of that road. About 20 percent of the road length listed for light reconstruction would actually have some work completed on it. Light reconstruction includes occasional drain dip construction with associated light blading and brushing, which is beyond the scope of pre-haul maintenance requirements needed to facilitate commercial haul. Drain dips reduce long-term sedimentation by forcing water off the roadbed at regular intervals, minimizing the distance water travels down the roadway. Spot rocking of

existing drain dips, outslope drains, riparian habitat conservation areas (RHCAs) and their contributing areas, and occasional rockings to improve sub-grade strength and sediment control are included in light reconstruction. All native surfaced FS roads, listed as such in Infra-Travel Routes, which are anticipated to receive log haul would be reviewed on the ground for light reconstruction during sale layout.

Medium - Medium reconstruction would include “Light reconstruction” plus the occasional clearing of vegetation, including trees 6 inches and greater; excavation of cutbank and roadbed for additional width to accommodate the critical vehicle (yarder, log truck, or other), embankment construction, and culvert replacement and installation. The listed lengths for medium reconstruction reflect an estimate of the road length to actually be impacted by medium reconstruction work activities.

Heavy - Heavy reconstruction would include “Light and Medium reconstruction” plus the maintenance and installation of large capital projects such as stream crossing structures. See East Wedge Transportation Specialist Report, Cornwall, 2011 for estimated lengths of all levels of proposed road reconstruction.

Maintenance levels are used to describe the intensity of maintenance effort needed on a road to allow the road to function and be used as it is intended. There are five different levels used by the FS to describe this intensity, with Level 1 being the lowest and Level 5 the highest. Following is a brief description of the maintenance levels [from Forest Service Manual (FSM) 7709.59] for FS roads found in the planning area.

Maintenance Level 1

These roads are assigned to intermittent service roads during the time they are closed to vehicular traffic. The closure period is one year or longer. Basic custodial maintenance is performed to keep damage to adjacent resources to an acceptable level and to perpetuate the road to facilitate future management activities. Emphasis is normally given to maintaining drainage facilities and runoff patterns. Planned road deterioration may occur at this level. Appropriate traffic management strategies are “prohibit” and “eliminate”. Roads placed in this category may be any type, class, or construction standard, and may be managed at any other maintenance level during the time they are open for traffic. However, while being maintained at Level 1, they are closed to vehicular traffic, but may be open and suitable for non-motorized uses.

Maintenance Level 2

Assigned to roads open for use by high clearance vehicles. Passenger car traffic is not a consideration. Traffic is normally minor, usually consisting of one or a combination of administrative, permitted, dispersed recreation, or other specialized uses. Log haul may occur at this level. Appropriate traffic management strategies are either (1) “discourage” or “prohibit” passenger cars or (2) “accept” or “discourage” high clearance vehicles.

Maintenance Level 3

Assigned to roads open and maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not considered priorities. Roads in this category are

typically low speed, single lane with turnouts and spot surfacing. Some roads may be fully surfaced with either native or processed material. Appropriate traffic management strategies are either “encourage” or “accept”.

According to the CNF document titled “Forest Scale Roads Analysis,” dated June 2005, it is estimated that 16 percent of Level 1 roads, 25 percent of Level 2 roads, and 100 percent of Level 3-5 roads (subject to Highway Safety Act) are maintained yearly. Declining road maintenance budgets has led to the situation where the yearly maintenance needs on the estimated 347 miles of Level 3-5 roads (estimated at \$254,000) require nearly 100 percent of the current CNF road maintenance budget, leaving little funding available for lower priority maintenance needs on Level 1 and 2 roads. This trend is expected to continue. Road maintenance requirements would be performed prior to, during, and after haul as per the road maintenance provisions in any resulting contracts.

Road Decommissioning (approximately 7.8 miles)

There are system roads totaling 7.8 miles, all with operational and objective maintenance levels of 1 that have been identified as priority candidates for decommissioning in this project transportation analysis. These road segments are currently closed to vehicular traffic. The determination of priority candidates was an interdisciplinary process between the members of the IDT, primarily the engineer, biologist and hydrologist. These roads would be considered for decommissioning after the project proposed harvest activities and post harvest treatments are completed. As per FSM 7734.1, decommissioning includes applying various treatments, including one or more of the following:

1. Reestablishing former drainage patterns, stabilizing slopes, and restoring vegetation;
2. Blocking the entrance to a road or installing water bars;
3. Removing culverts, reestablishing drainages, removing unstable fills, pulling back road shoulders, and scattering slash on the roadbed;
4. Completely eliminating the roadbed by restoring natural contours and slopes; and
5. Other methods designed to meet the specific conditions associated with the unneeded road.

The type of decommissioning is dependent on available funding, resource needs and associated risk, and public input received for each road. Decommissioned roads would be dropped from the Forest Road Atlas as “existing” but retained as “decommissioned” for future monitoring of the effectiveness of decommissioning efforts.

Danger Tree Management

On December 7, 2005 the PNW Region, Forest Service published FSM PNW Supplement No. 7730-2005-1 providing direction for danger tree management along roads in the National Forest. This supplement states that safety of forest users “is the predominant consideration in road operation and maintenance and takes priority over biological or other considerations.” It also recommends using the tools in timber sale and stewardship contracts to remove danger trees where possible. In the East Wedge planning area danger trees along haul routes would be designated by a qualified person and the hazard removed (either by cut and removal or cut and left on the ground).

The National Environmental Policy Act (NEPA) analysis for proposed road construction and reconstruction projects should include danger tree removal as a connected action, and over the life of the road, as a reasonably foreseeable action (including identification criteria and actions).

OHV Use

Off Highway Vehicles (OHV) are currently permitted on some Maintenance Level 2 roads within and adjacent to the East Wedge project area, as designated on the 2013 Motor Vehicle Use Map. Maintenance Level 2 roads are not designed for mixed traffic, so there is already somewhat of a safety risk. To help mitigate this hazard, logging and burning operations would post signs along the roads being used during implementation.

Easements

Due to the mixed pattern of ownership in the planning area it is often advantageous and prudent to utilize existing roads crossing non-NFS lands to access secluded FS timber stands. A list of easement deficiencies were identified during the transportation analysis and the affected landowners contacted. All landowners expressed a willingness to discuss limited access with the Forest Service.

Deferred Maintenance

Deferred maintenance is maintenance that was not performed when it should have been or when it was scheduled and which, therefore, was put off or delayed for a future period. When allowed to accumulate without limits or consideration of useful life, deferred maintenance leads to deterioration of performance, increased costs to repair, and decrease in asset value. Deferred maintenance needs may be categorized as critical or non-critical at any point in time. Continued deferral of non-critical maintenance would normally result in an increase in critical deferred maintenance. The observed level of deferred maintenance in the East Wedge Planning area has resulted in occurrences of erosion and/or sediment transport to streams. Where opportunities exist to reconstruct a road segment to overcome years of deferred maintenance, it has been identified as proposed reconstruction.

Alternative C

Declining or static road maintenance budgets are not allowing the Forest to maintain all Level 1 and 2 Maintenance roads to a degree that would bring them up to a self-maintaining level. Reconstruction and maintenance of open roads would help to mitigate this while improving road drainage and sight distance on open forest system roads while reducing deferred maintenance needs. It would also help to reduce sedimentation and erosion from currently closed roads that would otherwise not receive maintenance, and put them into a more self-maintaining condition prior to being placed into storage. To some extent, the maintenance required of the Timber Sale Purchaser would go towards meeting the basic Forest road maintenance needs on Level 1 and Level 2 roads used for haul during project implementation. Road maintenance requirements would be performed prior to, during, and after haul as per provisions in any resulting timber sale or stewardship contract.

No further opportunity exists to change the road segments proposed for new system roads to temporary roads so all new system road construction was removed in Alternative C. In addition

0.8 miles of reconstruction on Forest Roads 1500214, 470 and 482 was no longer necessary and removed from Alternative C. There would be a net loss of approximately 7.8 miles of system roads on the Forest Road System under Alternative C. This alternative also changes the authorized use of Forest Road 1500 from Open to Highway Legal Vehicles, to Open to All Vehicles. Because Alternative C only removes new system roads and a minor component of reconstruction from the Proposed Action, no further discussion is warranted.

Cumulative Effects

There would be a net loss of approximately 7.8 miles of system roads on the Forest Road System due to decommissioning closed roads. Cumulative effects of roads, as they may affect other resources, are discussed under individual resource sections.

There may be an increase in overall road density within the area due to timber harvest on non-NFS lands. It is unknown if there will be additional roads constructed for access to these lands or if they will be accessed through construction of temporary roads. Maintenance of any roads constructed for these activities will be the responsibility of the land owners. It is assumed Washington State Forest Practice Rules will be followed.

Soils

Introduction

The section below summarizes the existing conditions, direct, indirect and cumulative effects as analyzed in the East Wedge Soil Disturbance Assessment Report (M. Vander Meer and P. Marques 2011).

Data Collection

Field assessments addressed current soil disturbance characteristics for each project unit surveyed. Alternative proposed actions are compared against the soil standards established by the CNF to determine if implementation of the project would have a detrimental cumulative impact on the soil resource.

Field surveys included walking transects within each unit to determine the severity and extent of existing soil disturbance. Surveyors used a soil probe to determine soil compaction classes throughout the survey area. Disturbance classes of 2 or 3 were considered detrimental except where evidence suggested only short term disturbance with robust recovery. Field analysis utilized the Region 1 (R1) Soil Tech Guide (USDA 1999) to establish the existing level of soil disturbance.

Shallow soil pits were dug and examined for structure, texture, rupture resistance, rooting depth, rooting abundance and horizon thickness at regularly spaced locations, referred to as "soil disturbance sampling points". General observations were also made for each unit regarding presence of ash-cap topsoil, stand type and type of understory vegetation, evidence of past activities and slope and aspect.

Existing Condition

For the purposes of the decision-making process regarding the proposed action, this section summarizes the general character of the soils in the East Wedge project site, and bases its assessment on stratification of the collected data, rather than attempting to characterize the area by broad landform or soil-type mapping. Mapped soil types and landform associations for the region are often described as complexes due to the natural heterogeneity and complexity of natural systems. There are over 200 different soil types and complexes in this project area. This adds a degree of complexity to soils analysis not easily elucidated on a unit-by-unit basis. Instead, soil conditions as observed on the ground, together with field notes and other indicators of overall soil biophysical resiliency and a comparison of cumulative impacts of project implementation provide the necessary data for decision-makers.

Soils throughout the project area have two major influences: Continental Glaciation and Cascade volcanic activity, particularly the eruption of Mt. Mazama (6,800 yrs ago). Glacial activity scoured the landscape and left deep deposits of glacial till throughout the region. Mt. Mazama deposited between 6-8 inches of ash over Eastern Washington. This ash layer, distributed evenly across the landscape and then redistributed by water, gravity, wind and wildlife, is generally composed of silt-sized particles. It is characterized by a high moisture-holding capacity and good soil aggregation, major factors in overall soil productivity. As such, ash-capped soils are highly vulnerable to compaction by mechanized equipment. The existing conditions across the project area reflect a history of mechanized logging on these sensitive soils. Though different soil types will react differently to this mechanical compaction, the ash cap consistent throughout the project area is the most important factor affecting the soil's resiliency to disturbance.

In the description of several of the soil types typical of the region, using equipment with wheels or tracks on these soils causes rutting and compaction when the soil is moist. The frequency, duration and extent of mechanical action in a unit are considered the primary determinants of detrimental disturbance in the project area, as evidenced by existing conditions.

From a soil protection perspective, the project area is quite vulnerable to long-term detrimental disturbance. Several units have pockets of cedar stands that approach old-growth in character and display deep, wet peat-like soils (see assessment notes in project file). The primary characteristics that determine the vulnerability of the soils of the project area are:

- the fragile nature of the volcanic ash-capped soils
- moist soil conditions and associated short work season
- steep slopes
- forests still recovering after fire
- forests still recovering after logging

Of the 419 total units within the project area, 222 of them were evaluated for their current levels of soil detrimental disturbance, as well as other soil characteristics, such as coarse fragments, organic horizon and coarse woody debris (CWD). Skid trails and logging roads from past activities are the major sources of existing detrimental disturbance. Cattle grazing was also noted in several units and shown to contribute to detrimental soil disturbance (DSD). Table 18 summarizes existing DSD within the project area.

Table 18. Existing Detrimental Soil Disturbance

Existing DSD	# of Units	# of Acres
0-5%	52	2431
5.1-10%	69	3088
10.1-15%	33	1595
15.1 -20%	14	621
>20%	5	218
No Data*	246	7461

*Mechanical treatment is not proposed on these acres.

Direct and Indirect Effects

The proposed action includes a variety of mechanized and non-mechanized treatments that would improve forest health and decrease the chances of wildfires. Many of the proposed activities, particularly those relying on mechanization, also necessarily entail an additional detrimental disturbance to the soil resource. The season in which activities are carried out also changes the amount of disturbance. Generally, harvesting in the snow minimizes detrimental disturbance to soils as the snow and ice provides a cushion against the soil displacing and compacting effects of machinery. Table 19 below summarizes projected additional disturbance to the soil based on the equipment used. This table assumes that cable logging involves hand-cutting of trees and not the use of feller-bunchers or other mechanized harvesters. If mechanical equipment is used along with the cable, the Tractor/Cable disturbance numbers should be applied to those units and the units re-assessed for impacts.

Table 19. Projected Additional Soil Disturbance Based on Technique & Equipment Used

Logging System	# of Units	# of Acres	Expected % DSD from winter harvest	Expected % DSD from summer harvest
Tractor	50	2026	4	9
Tractor Portion only	167	1801	4	9
Escaliner/Cable	23	944	2	2
Tractor/Cable	116	3267	4	9
Hand	1	12	0	0

Prescribed Burning

The practice of prescribed burning typically involves digging a fire line and often with an excavator. The fire line, dug to the layer of mineral soil is seldom recovered to its natural condition after prescribed burning activities are completed (based on a decade of professional field observation and site monitoring). The removal of the organic layer in the digging of fire lines causes a break in soil biologic activity in the organic horizon and can quickly become a conduit for weeds to enter the site. The exact nature and acreages of prescribed burning are not

known at the time. Based on our professional experience, we can estimate an increase of 1% in detrimental disturbance to soils units prescribed for burning.

Slash Piling

As with mechanical harvesting, the treatment of slash with additional machinery can become a major source of detrimental disturbance and can have the most impactful cumulative effects in a project area. We assume that units prescribed for “piling” involve the mechanical piling of slash. Unpublished data from the Lolo National Forest in Montana ascribe anywhere from 0-6% additional detrimental disturbance from mechanical slash piling. We use the middle of that range (3%) for units prescribed mechanical piling.

In the context of units whose existing organic soil horizons are shallow and have low levels of downed woody debris, the piling of slash not only increases detrimental disturbance to the soil but robs the forest floor of essential organic material necessary for a fully functioning forest ecosystem, thereby increasing the cumulative detrimental effects of mechanical piling.

Road Construction and Decommissioning

The proposed action calls for a range of road building and decommissioning activities. Other specialist reports for this project contain details as to the extent of road building and details as to equipment to be used, techniques, and staging of materials. Clearly as roads are constructed, the use of that particular piece of land is transformed, its soil no longer capable of supporting vegetation. Some estimates from the CNF suggest 6 acres of forest land are disturbed for every mile of road constructed.

In-depth analysis of the length of road transecting each individual unit was not provided for this report. Instead, we add 1% of additional DSD to the 36 units through which a system road, would be built. Road reconstruction, maintenance, and decommissioning are not expected to contribute additional DSD.

Direct and Indirect Effects Summary

Table 20 summarizes the rates of additional DSD attributed to units with matching prescriptions. The type of machinery used in a forest setting is a primary consideration when projecting additional detrimental disturbance. In order to facilitate analysis and predictions of expected additional disturbance, the 36 prescribed actions have been grouped based on the expected additional disturbance they would incur across the project area.

Table 20. Projected Additional Soil Disturbance from Foreseeable Future Actions

Prescription	Additional Disturbance
Landings	1%
Mechanical Slash Piling	3%
Prescribed Burning	1%
Road Construction	1%

This table assumes that pre-commercial thinning is based on non-mechanized labor. In the case of fuel break prescriptions, disturbance would be concentrated in a strip of 200-300 feet along the road adjacent to the unit, and thus attribute only half of the disturbance of ground-based operation to these units. In cases where two harvest types are prescribed, such as a commercial thin and fuel break (FB_HTH), the most impactful activity is used to ascribe projected detrimental disturbance. In this example, the unit would be grouped as a commercial thin, not a fuel break.

Under the proposed action, 12 units totaling 666 acres would have cumulative DSD above the 20% threshold when logged in either winter or summer. An additional 10 units, totaling 282 acres, would exceed the 20% threshold if logged in the summer, but would remain under the threshold if logged in winter conditions. Because these units would be winter logged (see Design Elements Appendix C) they would remain below the 20% threshold.

For 116 of the project units, an alternative treatment prescription is possible under the proposed action. Most of these alternatives leave the units to which they are prescribed with less DSD than prescriptions evaluated above and are assumed to be interchangeable with the prescriptions evaluated above, as determined by the Forest. Most relevant to this report, however are those units in which the choice of the alternative prescription would bring the total DSD of the unit below the 20% threshold.

Alternative C

Under Alternative C, proposed forest activities would be reduced due to the elimination of new road construction and some other road improvement and maintenance activities from the project. Under this alternative, no new system roads would be constructed, thus eliminating 35 inaccessible units from treatment. Some prescriptions for specific units changed under Alternative C action also, but in no case is the change of prescription expected to cause additional detrimental soil disturbance or cause a units' expected disturbance to exceed the soil standard. A lower level of detrimental soil disturbance is expected across all units where road building or improvement activities would be dropped.

None of the dropped units in Alternative C were expected to exceed the soil standard, thus Alternative C would have no net difference from the proposed action in relation to units expected to exceed the soil standard. Three (3) units would remain under the 20% DSD standard if Alternative C were chosen over the prescribed action. In addition, units 2430281 and 2410017, if logged in the summer, would remain under the DSD standard if Alternative C were chosen. For ten (10) units, a choice of Alternative C would signify a reduction in resulting total DSD, but total disturbance would remain above the 20% standard.

With the change in the designation of Forest Road 1500, there is the increased possibility of illegal OHV use off this road. This may result in additional soils impacts through erosion and/or compaction. However, this is expected to be minimal because this road primarily provides a connection between other arterial roads that are already available for OHV use.

Summary

This section summarizes the expected DSD after implementation of the proposed action. Skilled operators would employ all applicable techniques that minimize soil disturbance. BMPs would be used during road building and forestry practices. Forest units that have experienced a moderate to high amount of detrimental disturbance in the past are vulnerable to cumulative nutrient effects. Past harvest activities have removed considerable amounts of carbon and also decreased annual litter fall for a time. This could lead to cumulative impacts on nutrient cycling. The elements and processes that maintain nutrient capital and cycling must be protected. Employing mitigations, design standards, and timber sale contract provisions would ensure no cumulative nutrient-related effects, especially maintaining intact organic layers.

By wording of CNF soil standards, “the cumulative detrimental effects from project implementation and restoration must, at a minimum, not exceed the conditions prior to the planned activity and should move toward a net improvement in soil quality”. BMPs and mitigation strategies would be used to help move units toward net improvements in soil quality. Combinations of restoration activities would need to be added to prescriptions for the above-mentioned units to adhere to forest soil standards.

Activity units that have had little prior disturbance would show a greater incremental increase in detrimental disturbance than those units that already contain a network of existing skid trails. Disturbance would be minimized in areas already containing a network of existing skid trails because equipment would re-use some, if not all, existing skid trails, when logging in summer.

If all natural elements and processes remain intact, impacts to soil would be nearly undetectable within 20 to 40 years based on professional judgment and experience on these soil types. Freeze-thaw cycles, soil organisms, and root growth would help alleviate compaction and rutting. Soil displacement may last longer, but design features and timber sale contract provisions would be intended to minimize soil displacement.

Cumulative Effects

Effects of past and present activities are listed in the discussion on the effects of the No Action alternative and considered in the baseline discussions. The exact location of the Pacific Northwest trail is unknown but most of the trail is expected to be located on existing trails and roads. Impacts would be minimal and are not expected to measurably change the conditions of the soil within the planning area. The Summit Pierre timber sale is occurring outside the planning area and would not cumulatively impact the soils. While there are expected to be additional impacts to the soil resources from the harvest on non-NFS lands, practices are expected to follow Washington State Forest Practice Rules and would not impact NFS lands. No other activities identified in Table 9 are expected to add additional impacts to the soils beyond existing conditions. The impacts of the proposed activities combined with ongoing and foreseeable activities would be within Forest Plan standards for the soil resource.

Hydrology

This section is a summary of, and incorporates by reference, the East Wedge Hydrology report located in the project file (Wasson 2012). The East Wedge Project planning area occupies

portions of two 4th field sub-basins; the Kettle River and the Franklin D. Roosevelt Lake sub-basins. Both of the sub-basins cross the US/Canadian Border but this analysis only deals with the US portion. The Kettle River sub-basin is further divided into six watersheds. Of these six watersheds, only one is within the East Wedge Project boundary. Within this watershed there are ten sub-watersheds, of which only two of those sub-watersheds are within the East Wedge Project boundary (Deep Creek and Toulou Creek sub-watersheds). The Franklin D. Roosevelt Lake Sub basin is divided into five watersheds, of which only one is within the East Wedge Project. Within this watershed there are nine sub-watersheds, of which only five of those sub-watersheds are within the East Wedge Project boundary (Flat Creek, Crown Creek, Rattlesnake Creek, Fivemile Creek, and Big Sheep Creek sub watersheds). This analysis considers these seven sub-watersheds along with currently available information and the best available science.

No single method or combinations of methods provide a definitive assessment of stream function. The inherent temporal and spatial variability in aquatic systems, coupled with the lack of quantitative standards for most aquatic parameters, necessitates a qualitative approach to a final assessment. Consequently, determination of the overall condition of aquatic resources is very much an exercise in interdisciplinary professional judgment, and the various inventories and assessments provide a basis for the conclusion.

Watershed Condition

Road density in a watershed is used to assess watershed condition and potential risk of hydrologic change. Compacted road surfaces reduce infiltration of surface water and therefore contribute directly to increased surface runoff. Research has consistently shown that roads increase erosion more than any other practice associated with forest management (Megahan and King 2004). Surface erosion is the dominant management-related erosion process on roads on the CNF.

Road density guidelines have been developed by the National Oceanographic and Atmospheric Administration. These guidelines refer to the probability that the runoff regime (timing, magnitude, duration and spatial distribution of runoff) of the watershed can be altered by increasing road density. These guidelines are:

- <1 mile of road per sq. mi. is a low risk of alteration
- 1-3 miles of road per sq. mi. is a moderate risk of alteration
- >3 mile of road per sq. mi. is a high risk of alteration

There are no CNF standards or guidelines for road density. Under the proposed action there would be slight decreases or no change by sub-watershed compared to the no action alternative and alternative C. The percent change reflects only new road construction and road decommissioning; it does not include reconstruction, temporary roads or road maintenance.

Within the project area, the change in road density due to implementation of the proposed action is slightly negative and is considered minor. The proposed action consists of 5.9 miles of new road construction, 61.8 miles of road reconstruction, 3.7 miles of temporary road construction and 7.8 miles of road decommissioning. Road reconstruction is considered beneficial for reducing potential risk of change in the runoff regime and the resulting eroded material reaching

the streams. While road reconstruction would cause temporary disturbance of the road surface, Best Management Practices (BMPs) would be expected to minimize mobilized soil from reaching the streams. Each of the proposed road treatments have been carefully assessed and are not expected to cause detrimental effects to streams if the appropriate BMPs are implemented.

Sediment Yield

Sediment yield is defined as the movement of sediment past a point in the stream system over a period of time. Sediment yield is a 'natural' process that, along with stream flow, gradually degrades mountains into flat lands. It is the 'accelerated' sediment yield (suspended sediment and turbidity or cloudiness) caused by management activities that is of concern to fisheries because it is closely associated with the amount of deposition on the stream bottom. Deposition of fine sediment (less than 6 mm in diameter) has the potential to affect fish spawning success, the ability of streams to support fish over the winter (function of pool depth), and fish food production (generally insects). Deposition of coarse sediment can affect channel morphology. Maintaining soil organic layers and functioning riparian zones are strategies that are used to minimize accelerated sediment production and delivery through non-disturbance. Suspended sediment is the major non-point source pollution problem in forests, most often associated with forest roads (MacDonald and Stednick 2003).

The spatial pattern and location of proposed treatments relative to the stream network influences the amount of sediment that is delivered from severely disturbed areas. Forest management activities often generate a mosaic of severely disturbed areas (clearcuts, skid trails and landings) and relatively undisturbed riparian areas. The former usually are considered sediment source areas and the latter usually serve as sediment sinks. If the runoff and sediment yields from the source areas are less than the absorption capacity of the downstream sediment sinks, there would be little or no change in runoff and sediment yields at the watershed scale. For this reason, though watershed-scale changes in sediment yields tend to be correlated with the amount of disturbance in a watershed, a high level of disturbance does not always mean that there would be a detectable change in sediment yields at the watershed scale (Haupt and Kidd 1965).

There would be a short-term increase in sediment yield associated with the proposed road treatments in the proposed action. However the long term benefits of repairing road drainage and reducing the potential for sediment delivery should outweigh these impacts. The increases would be temporary and not unlike a spring storm event that erodes channel banks. Overall, sediment yields would be reduced as the reconstructed drainage structures begin to function. The beneficial uses of the water draining from these watersheds would not be impaired by the proposed action or alternative C. Proposed treatment units are located on land-types with low sediment delivery potential and have been specifically designed to avoid or reduce the potential for sediment production and delivery (see Appendix E – Best Management Practices.).

The felling, harvesting and removal of timber as defined for the Proposed Action and Alternative C would not detrimentally affect sediment yield within the planning area. The unit location, unit prescriptions and Design Elements (Appendix C) have been site specifically designed to avoid or reduce the potential for sediment production and delivery. Logging practices provide for better protection of aquatic resources since the advent of BMPs and other

mitigation practices such as Riparian Habitat Conservation Areas (RHCA). Timber harvesting can occur even in impaired watersheds without detrimentally contributing to the impaired watershed condition. In some instances the use of new management practices can actually improve watershed functions and aid in the recovery of impaired areas. Research studies and monitoring results verify that when RHCA or adequate buffer strips are incorporated into timber sales, sediment delivery to stream channels is “not measurable” or “is negligible” (Belt et al. 1992, Reid and Hilton 1998). Buffer strips are effective at trapping sediment from overland flow. Soil mobilized by harvest activities in the Proposed Action would likely be filtered and captured by vegetation remaining in the RHCA buffers before reaching streams.

The landing areas used for this project would be improved or created to accommodate timber processing, fuel storage and refueling needs. This would include minor excavation to create a safe usable area and some spot gravelling to harden the surface. These areas would be constructed and rehabilitated according to BMPs and are not expected to adversely affect sediment production and delivery.

Roads are the primary focus for sediment yield because research indicates forest roads are usually the leading contributor of sediment to stream channels (Gucinski et al. 2001, Bilby et al. 1989, Duncan et al. 1987). This is particularly true where roads are immediately adjacent to a stream or at road/stream crossings. Using appropriate design criteria, roads can be built and maintained so that they minimize the potential to intercept, concentrate, and route runoff water to streams and unstable slopes adjacent to streams. Research has shown that when roads are designed with specific criteria and BMPs they produce less accelerated sediment (Megahan et al. 1992).

Road reconstruction would reduce sedimentation by improving roadbed drainage (rocking and ditching the travel way) and channelling runoff onto the forest floor where it can infiltrate and settle out eroded soil material. Road construction would follow BMPs to minimize sediment movement. Organic material becomes mixed with this runoff and contributes to the productive soil base. Infiltrated water contributes to groundwater and is gradually released into live streams.

The major factor that determines the effects of prescribed burning on runoff and erosion is the amount of disturbance to the surface organic material (duff) that protects the underlying mineral soil. Any loss of organic matter in the uppermost layers of the mineral soil alters the structure of the surface soil. The resultant breakup of the soil particles can greatly increase its susceptibility to erosion (Brown et al. 1985; DeBano et al. 1998; Robichaud and Waldrop 1994; Ryan 2002; Wells et al. 1979). Prescribed fires are generally designed to leave some residual duff to protect the mineral soil and maintain high infiltration rates, which minimizes potential erosion. Where fire lines are employed, frequent water barring would prevent erosion.

Prescribed burning activities, ranging from underburning to pile burning, are not expected to cause onsite soil erosion or accelerated sedimentation. This is due to the maintenance of the soil organic layer and much of the duff. These treatments are done in the spring and the fall during periods of cool, moist weather. Slash and logging debris is consumed but the soil condition is not changed.

The action alternatives would not reduce the amount of riparian vegetation in the RHCAs. No activities are planned in the RHCAs, but fire may be allowed to creep into the RHCAs under certain circumstances. Runoff or overland flow would not likely occur. However, RHCAs do function as filter zones. The prescribed burning activities would not negatively affect stream function or sediment production and delivery.

Machine piling would occur on several of the units within the planning area. These units would be accessed from existing roads, skid trails, and fire lines below or within the proposed units. No trails would be excavated to facilitate access for these treatments. Residual logging debris which was lopped and scattered and not burned would increase potential fire intensity and severity for a few years until snow could compress the slash mat and the fine organics would be decayed. Overall, reducing existing and potential fuel loadings would reduce the long-term potential for severe fire within the units. In some cases, burning of the slash piles would create small patches of burned soils, but the areas would not be large or extensive enough to alter the slope hydrologic response or slope stability. While some eroded soil may be mobilized from mechanical slash disposal treatments and site preparation for planting, this soil is expected to be filtered out and stabilized before it reaches the stream channels as sediment.

Channel Morphology

Stream types (Rosgen 1994; Rosgen 2001) are a means of describing the physical attributes of a stream reach, including channel morphology. By comparing individual parameters (such as entrenchment, width-to-depth ratio, sinuosity, gradient, and substrate particle size) of a “project” reach with those of a “reference”, minimally disturbed, reach from a similar watershed, the capability of the project reach to perform its physical functions, and the condition of the watershed, can be inferred (Benegfield 1999; Rosgen 1998). A stream performs three major physical functions: (1) sediment transport, (2) reduction in flood energy by utilizing its flood plain at high flows, and (3) maintenance of the local water table (Rosgen 2001). If the measured parameters are comparable between the project and reference reaches, the channel is likely in good condition and “functioning.” If any of these functions are compromised, it is likely that other portion of the aquatic ecosystem, such as fish habitat and reach stability are adversely affected (Rosgen 1998; Rosgen 1999; Benegfield 1999).

The potential for changes in channel morphology depends on changes in water yield, sediment yield, livestock activity or flood events in the watersheds. This report indicates that very few, if any, changes are expected in these factors due to the proposed project. Therefore, channel morphology is not expected to change due to the proposal.

A number of stream reaches in the Deep Creek and Toulou Creek sub-watersheds have been surveyed using the Rosgen method in the project area. (Per Jennifer Hickenbottom, USFS 2013.) Field reviews were completed in July 2010, specific to the East Wedge analysis. The field surveys were primarily conducted where management activities are proposed.

Water Quality

Water quality includes physical and chemical characteristics of water. Commonly measured pollutants of concern include turbidity, pH, alkalinity, hardness, dissolved oxygen, nutrients,

metals, sediment, fecal coliform and water temperature. Some of these parameters are affected only to a slight degree, or not at all, by forest practices. Water temperature controls the rate of biologic processes, and is of concern for fish populations as a primary indicator of habitat conditions.

The Washington State Department of Ecology has assessed water quality data collected by the Forest on streams within the project area since 1974. Currently two stream reaches are listed as impaired: one in Deep Creek and one in Fisher Creek. Both are listed as impaired for pH level. It would appear that the elevated pH is due to the nature of the limestone rock in the area. The proposed treatment activities would not be expected to affect the pH levels of any of the creeks.

All of the State's waters are categorized into one or more of five different categories:

- Category 1: Waters attaining standards tested for;
- Category 2: Waters of concern;
- Category 3: Waters with insufficient data and information to determine if any standards are attained;
- Category 4: Impaired or threatened waters that do not require a Total Maximum Daily Load (TMDL) study;
- Category 5: Waters that are impaired or threatened for one or more standards and require a TMDL ;

Within the project area, the following streams had elevated readings:

- American Fork of Sheep Creek had one elevated fecal coliform reading between 1974 and 1995.
- East Fork Crown Creek has had 8 elevated fecal coliform and one elevated temperature reading between 1990 and 2001.
- Flat Creek has had 9 elevated fecal coliform readings between 1977 and 2001
- Deep Creek had 1 elevated fecal coliform reading between 1977 and 1995.
- Fisher Creek (intermittent) had 3 elevated fecal coliform readings between 1995 and 1997.
- Pierre Creek had 1 elevated fecal coliform reading between 1960 and 2001.

The elevated fecal coliform levels are probably due to livestock grazing or wildlife since they are both known sources of fecal coliform bacteria. The CNF Implementation Plan did not impose a Load Allocation or reduction due to these exceedances.

By maintaining RHCAs, following BMPs, and reducing sediment concerns associated with at-risk culverts and roads, the water quality issues associated with the TMDLs would be addressed. Watershed improvements would strive to benefit the TMDL process and reduce the pollutants of concern.

Suspended sediment is the major non point-source pollution problem in forests and is most often associated with forest roads (MacDonald and Stednick 2003). Sediment and turbidity are the most common water-quality responses associated with fire (Beschta 1990). Erosion resulting from prescribed burning itself is generally less than that resulting from roads, skid trails, and site preparation techniques that cause soil disturbance, that are often a necessary component of fuel

reduction projects (U.S. Environmental Protection Agency 2005). Given the location of the proposed burns and the use of riparian buffers (INFISH 1995) there is a low potential that sediment from fire lines, released nutrients, or water foaming agents would be delivered to streams and tributaries. The risk of the proposed action and alternative C increasing sediment in the streams of the planning area is discussed more fully above under Sediment Yield.

No creeks in the planning area are listed in the 2008 TMDL Integrated Report for temperature (thermal modifications). Exposure of small streams to direct solar radiation is the dominant process for stream temperature increases (Tiedemann et al. 1979). Other mechanisms include increased air temperature, channel widening, soil water temperature increases, and stream flow modification (Ice 1999). Streams with smaller surface areas may be more susceptible to heating, but usually return to expected temperatures within 500 feet (150m) downstream (Andrus and Froehlich 1991). Maintaining shade in riparian zones can be used to avoid most temperature increases in small streams. As stream width increases, more of the water surface is exposed to sunlight, consequently reducing the influence of riparian canopy on stream temperature. The maintenance of streamside vegetation as a thermal cover is key to maintaining stream temperatures at existing levels. The action alternatives in the project area are designed to minimize effects on streamside temperature. There may be some incidental shade reductions at stream crossings due to culvert placement, replacement, or removal, but they are expected to be in compliance with the temperature criteria.

Herbicides have been used sparingly and judiciously on the CNF on noxious weeds in accordance with the requirements of the CNF Noxious Weed EIS. Monitoring of water quality has not detected herbicide contaminants from this low level use in the past (Fletcher 2009). Noxious weed control would not be used at stream crossings. Noxious weed treatments can reduce vegetative ground cover, but does not remove protective organic layers and occurs over relatively small treatment areas away from streams.

Water Yield

Water yield is defined as the amount of water flowing both overland and underground from a given watershed or sub-watershed usually over a specific period of time, i.e. a year. The proposed activities are expected to result in a small (undetectable) immediate short-term increase in peak flows in all of the sub-watersheds. However, the risk of change to beneficial uses is low because of the small percentage of the sub-watersheds impacted and the estimated small quantity being used. The water yield increases are not expected to continue past 10 years from the time of harvest.

The removal of forest cover increases the amount of rain and snow (precipitation) that reaches the forest floor, and decreases the amount of water that is taken up by plants. In wetter climates, this generally increases annual water yields (Bosch and Hewlett 1982; MacDonald and Stednick 2003). The increase is assumed to be proportional to the amount of forest cover removed, but studies show that at least 15 to 20 percent of the forest cover in a larger watershed (5th field HUC) has to be removed to have a statistically detectable effect (MacDonald and Stednick 2003). In areas where the annual precipitation is less than 18 to 20 inches (450 to 500 mm), removal of the forest canopy is unlikely to greatly increase annual water yields (Bosch and Hewlett 1982). In drier areas, the effects are generally offset by the increase in soil evaporation

because more sun is reaching the forest floor, so there is no net change in runoff as long as there is no change in the underlying runoff processes (for example, a shift from subsurface storm flow to overland flow due to soil compaction) (MacDonald and Stednick 2003).

The closest weather station to the planning area is an annual storage gauge located on Fisher Creek just west of the planning area (T40N, R37E, S 2) at an elevation of 3,200 feet. Average annual precipitation recorded at this site from 1979 to present is 22.98 inches. The majority of the planning area lies at or below this elevation. Precipitation along the Kettle River valley and the Columbia River at Northport ranges up from 15 inches to about 20 inches annually. The hundred-year average precipitation for Colville, Washington is 17.8 inches. Precipitation in the analysis area is somewhat higher than along the river valleys (and at Colville) due to the influence of elevation in the mountains.

Vegetation removal and prescribed fire treatments in the planning area due to the proposed action are summarized in Table 21. Harvest treatment which removes over 50% of the basal

Table 21. Summary of Overstory Effects by Sub-Watershed

Sub Watershed	Area within Project (acres)	Over 50% Basal Area Removed (acres)	% of Sub Watershed Treated with This Harvest	Rx Fire Treatment (acres)	% of Sub Watershed Treated with Rx Fire
Deep	5252	424	8	1575	30
Toulou	13496	843	6	3032	22
Big Sheep Creek	15058	373	2	1379	9
Crown Creek	5619	60	1	1460	30
Rattlesnake Creek	2353	89	4	784	33
Flat Creek	5798	451	8	2540	44
Five Mile Creek	1742	78	4	711	41

area is compared to the area within the sub-watershed and acres of prescribed burning are compared to the area within the sub-watershed. Since plants rapidly recover in partially thinned areas and resume using soil water and intercepting rain and snow, any increase in runoff due to thinning operations is likely to persist for no more than 5 to 10 years. Since low-severity prescribed fires do not kill many trees or remove much of the duff layer, the effects of burning are generally too small to quantify.

The timing of the increase in runoff due to forest harvest is important because of the potential impact on water supplies, sediment transport capacity, bank erosion, and aquatic ecosystems. If forest harvest only increases low or moderate flows, one would expect little or no change in channel erosion or sediment yields; an increase in peak flows may increase annual sediment yields (Lewis 1998; Schumm 1971). In snowpack-dominated environments, like those found in the planning area, increase in runoff would typically occur in early spring. This is because

forest harvest reduces plants so the amount of soil moisture carried over the winter from the previous fall is higher. Less snowmelt is needed for soil moisture recharge, so more of the early season melt is converted into runoff. The reduction in forest canopy also increases the amount of solar radiation that reaches the surface of the snowpack which increase the rate of snowmelt and may slightly accelerate the timing of peak runoff (MacDonald and Stednick 2003; Troendle and King 1985).

When looking at a variety of watershed studies, thinning less than 40 percent of a watershed is unlikely to cause a detectable change in the size of peak flows in rain-dominated areas, and would only result in a 14 percent increase in the size of peak flows in the transient snow zone (Grant et al. 2008). Both the available data and this specialist's understanding of hydrologic processes indicate that thinning generally should have little or no effect on the size of peak flows due to a rain-on-snow event. Tractor yarding units that are treated during the winter season would also help reduce the effects of peak flows. In general, the changes in the size of peak flows due to forest management are small when compared to the annual precipitation variability.

As previously mentioned, the 5.9 miles of new road construction in the proposed action would slightly increase the amount of water shed off roads that infiltrates the forest floor. The dispersion of surface runoff would help "normalize" the flow regime of a sub-watershed by recharging the groundwater that would slowly release into the live streams. There would be less opportunity for water to concentrate and be delivered to the naturally less stable stream banks. The volume of water and sediment delivered to stream channels (especially during peak flow conditions) would be reduced, as more water and sediment would be cross drained and infiltrated before reaching the channel.

Conclusion

Based on the history of past treatments, the known existing condition, and the analysis of the proposed treatment alternatives, it is concluded that neither the proposed action nor alternative C would have an adverse effect on the hydrology of the project area. The five indicators considered - watershed condition, sediment yield, channel morphology, water quality, and water yield - are not expected to change significantly and the management direction contained in the Regulatory Framework would be met. The BMPs indicated are expected to provide adequate protection of the water resources.

As previously discussed, in the entire project area there would be short-term negative effects due to the disturbance of the selected treatment alternative. Gains in the long-term would be due to the repair of road/stream crossings, road reconstruction and restoration of impaired areas. The long-term benefits to the watersheds would be mostly by the increased infiltration and decreased run off and peak flows due to this work.

Direct, Indirect and Cumulative Effects

Alternative C consists of the Proposed Action with the following changes: 1) No new system roads would be constructed. 2) Some stands would be re-delineated to reflect the decrease in construction of new system roads for harvest. 3) No new stands would be added. 4) The authorized use of Forest road 1500 from Open to Highway Legal Vehicles to Open to all

Vehicles. These changes results in .83 miles of decreased road reconstruction, decreases the acres of Rx Fire by 159 acres, decreases fuelbreaks by 52 acres, and decreases thinning by 690 acres; thus reducing any potential direct and indirect effects to the hydrology resources.

Because portions of the proposed action (Deep and Toulou sub-watershed) drain into the Kettle sub-basin, there is a potential for cumulative watershed effects of the East Wedge Project to occur there. The Summit-Pierre project located to the west is ongoing at this time and will continue into the reasonably foreseeable future. These effects (Deep and Toulou sub-watersheds) would be cumulative to those analyzed in the Summit-Pierre project analysis. The proposed action and Alternative C are consistent with the current CNF Forest Plan direction, and these potential cumulative effects are expected to be slight and within the standards and guidelines. It would be a consideration if the timing of the Deep and Toulou sub-watershed treatments were delayed until the end of the East Wedge project period to allow more time for revegetation and hydrologic recovery to occur. The standards and guidelines would be met regardless. The impacts are minimal and within the Forest Plan Standards and Guidelines. This project is also consistent with the Clean Water Act.

Watershed Condition: No cumulative effects would be expected in either sub-basin since road density would not change with either action alternative.

Sediment yield: Minor cumulative effects would occur during the project since sediment yield may increase in the short term due to road maintenance. These effects are not expected to be adverse in regard to channel morphology or fish habitat.

Channel Morphology: No adverse cumulative effects are expected since no direct or indirect effects are predicted from the history of similar forest treatments in the Sub basins.

Water Quality: No adverse cumulative effects are expected since no direct or indirect effects are predicted. Best Management Practices are expected to protect water quality.

Water Yield: The potential cumulative effects due to timber harvest of either of the action alternatives in either of the sub-basins is expected to be undetectable due to the small watershed area involved and the variability of annual water yield.

The benefits gained by placing more area under forest management out-weights the short-term impacts or disturbances of either action alternative.

Riparian Areas and Fisheries

Introduction

This section is a summary of, and incorporates by reference, the East Wedge Fisheries report located in the project file (Newman 2011). Activities proposed as part of the East Wedge action alternatives have potential impacts to Crown Creek, Flat Creek, American Fork Big Sheep Creek, Deep Creek, and Pierre Creek drainages. The Inland Native Fisheries Strategy (INFISH) uses the term Riparian Habitat Conservation Area (RHCA) to categorize portions of watersheds where riparian-dependent resources receive primary emphasis and management activities are

subject to specific standards and guidelines. Design Elements (Appendix C) were developed specific to the proposed action to provide retention of the INFISH buffers and their benefits.

Data Collection

The various lakes and streams within the project area provide habitat for redband, eastern brook and rainbow trout, as well as other native (non-game) and planted game fish. The streams within the project area were recently surveyed between 1993 and 2010, and will be discussed individually later.

Direct and Indirect Effects

Water Bodies in the East Wedge Area

Zodiak and Canadian Tributary are tributaries to American Fork, which is tributary to Big Sheep Creek; all are relatively stable creeks. Although Zodiak and Canadian Tributary can be fishery streams the fish, usually eastern brook trout, will be found closer to the confluences. American Fork is a fishery throughout its length and into Big Sheep Creek (Honeycutt 2011).

Deep Creek is a stable stream. There has been very little riparian harvest, hence there are large mature cedars in the surveyed fisheries reaches. The stream banks are stabilized by vegetation and boulders and there is localized cattle disturbance. County road 4212 runs along fisheries reach 1, however, due to the stable riparian area the road has little effect on the stream, or the fisheries population. Deep Creek is isolated from the Kettle River by a fish barrier falls, yet it supports a diverse and healthy population of Westslope Cutthroat Trout and Eastern Brook Trout.

Pierre Creek has a long history of beaver dam construction, dominating the processes in and along the stream. Active beaver dams form large ponds and as old beaver dams dry out the stream down-cuts through them. Where there has been no beaver dam construction, there are large cedar trees. There was a fish barrier culvert on the 1500080 road that was replaced in 2012. This culvert was not the only fish barrier within the planning area, but it was the only one planned for upgrade.

Flat Creek and Crown Creek are also relatively stable streams, but some reaches have damaged banks. These sites were identified in the Border Cluster Allotment Evaluation (CNF 2006). Mitigation measures in that evaluation call for salting away from the creeks. This would draw livestock away from creek bottoms and ponding areas, allowing for banks to revegetate and restabilize.

Fisheries Population Condition

Regionally, most native salmonid numbers and distributions are lower than historic levels. This decline is due to dam construction and operation, water diversions, introduction of non-native fish species, over-harvest, and habitat degradation.

Habitat for all native fish would be protected through implementation of the INFISH Standards and Guidelines (USDA-Forest Service, 1995). Implementation of the standards and guidelines listed in INFISH ensures that FS activities do not alter the natural processes of streams.

Bull Trout

Population surveys were done in 1991, 1992, 1993, 1995, 1996, and 2004. No bull trout were found. Bull trout are not known to inhabit any of these creeks and tributaries but bull trout habitat is protected by following INFISH standards and guidelines. There are fish barrier falls at Pierre Creek and the Kettle River at Laurier that prevent bull trout getting into the East Wedge Project area. Flat Creek flows subsurface prior to its confluence with the Columbia River resulting in no fish passage. Bull trout have been found at the mouth of Sheep Creek, but a barrier falls prevents migration into the project area.

Critical habitat was proposed for the bull trout in 1999. In the Fall of 2010, critical habitat was delineated, however the watersheds within the project area are not included in the rule (Honeycutt pers. comm., 2010). This project may affect, not likely to adversely affect bull trout or critical habitat from any of the alternatives.

Westslope Cutthroat Trout, Rainbow Trout/Redband Trout

A subspecies of rainbow trout, redband or interior rainbow, ranges from the east side of the Cascade Mountains to the Selkirk Mountains. For this analysis, they will be referred to as rainbow trout when describing general populations and redband trout when describing unique genetic populations. Rainbow trout populations have been found throughout the Colville National Forest. Genetic testing of many of these populations have determined that presently 10 pure redband trout populations exist on the CNF including tributaries of the Kettle River and tributaries to Lake Roosevelt.

Surveys below the culvert to be replaced on Pierre Creek have indicated westslope cutthroat, cutthroat hybrids, redband trout, brook trout, and rainbow trout hybrids.

Deep Creek has a healthy population of westslope cutthroat trout, westslope cutthroat/redband trout hybrids and eastern brook trout. However, there is a fish barrier on private land in Deep Creek, downstream of the project area, which isolates westslope cutthroats in the East Wedge project area from the Kettle River. Westslope cutthroat trout, redband trout, and eastern brook trout have been found in Pierre Creek.

Fish Passage

Currently there is no fish passage from the Kettle River to the NFS lands in the project area. There are waterfalls on both Deep and Pierre Creeks (private lands) which prevent fish passage. A culvert on Pierre Creek near Fisher Creek that had been a fish passage barrier was replaced in 2012. This replacement will not be discussed here as the NEPA review is complete for that project. However, there is no surface connection between Pierre Creek and the Kettle River as Pierre Creek dries below Pierre Lake.

Disturbance History

Three cattle allotments (Hope Mountain, Churchill Mountain, and Elbow Lake) are located within the planning area. The allotments are active and used seasonally by three permittees. Cattle impacts are localized in nature and relate to springs, openings from past harvest, and natural openings. There are natural barriers created by dense vegetation and riparian fencing in areas to protect streams and limit livestock access to some of the most delicate areas (Border

Cluster 2006). There are still some areas that are sensitive to trampling and over use, which would need attention.

INFISH Riparian Management Objectives (RMOs) in the Planning Area

This section lists the INFISH RMOs on the fish bearing streams, and discusses whether or not they are met. Deep Creek, Crown Creek, American Fork, Flat Creek, and Pierre Creek are fish bearing streams with eastern brook trout on all but Deep Creek. The INFISH Riparian Management Objectives (RMO) are measured with four variables that affect native fish species: temperature, large woody debris (LWD), width to depth ratio (w:d), and number of pools per mile (ppm). Formal habitat surveys to measure INFISH RMOs are not done on small, non-fish bearing streams. Table 22 shows streams surveyed and summarizes INFISH RMO data, where available.

Table 22. East Wedge Project Area Streams and INFISH RMO Data Summary

Stream Name	Survey Year	Reach	Temp	LWD	W:D ¹	PPM ²
American Fk.*	2010	1	12		14	
American Fk.*	2010	3	5		12	
Canadian Fk.*	1996	1	12	111	6	59
Deep Ck.	2004	1		33		5
Deep Ck.	2004	3	15	28	18	20
Deep Ck.	2004	5	12	47	12	32
Deep Ck.	2004	6	7	28	10	8
EF Crown Ck.	1993	1	14	11	10	5
EF Crown Ck.	1993	2	16	139	5	19
EF Crown Ck.	1993	3	12	248	5	6
EF Crown Ck.	1993	4	14	213	7	36
EF Crown Ck.	1993	5	16	82	11	21
Fisher Ck.	1991	1		10		5
Fisher Ck.	1991	2	10	357		2
Flat Ck.	2004	1	9		8	
Flat Ck.	2004	2	12		6	
Pierre Ck.	2004	1	8	25	18	25
Pierre Ck.	2004	3	13		18	1
Pierre Ck.	2004	4	11	18	13	24
Rattlesnake Ck.	1998					
WF Crown Ck.	2004	1	9	82	10	32
Zodiak Ck.*	1996					

¹Bankfull width:depth unless otherwise stated

²Pools per Mile

*American Fork, Canadian Fork, and Zodiak Creek are tributaries to Big Sheep Creek.

Temperature

At the time of the surveys, all stream reaches within the project area met the INFISH RMO for temperature. The maximum temperatures recorded during the summer stream inventory are lower than the INFISH RMO of 16° C. Stream temperatures of the surveyed streams are not a limiting factor in supporting trout.

Large Woody Debris (LWD)

Most stream reaches met the INFISH RMO for large woody debris (LWD). Low LWD numbers mean reduced stream habitat diversity and therefore, reduced ability to support a diversity of

species and ages of trout. The INFISH RMO is a minimum of 20 pieces of LWD (12 inches in diameter at 35 feet from the large end) in each mile of stream. This is achieved through the standard of managing the RHCAs to provide these large pieces of wood to the stream channel (INFISH TM-1b).

Bankfull Width to Depth Ratio (BFWD)

The width to depth ratio as described in INFISH is for wetted width and depth. This has been changed for this analysis to bankfull width to depth (BFWD). It is easier to repeat and compare bankfull width to depth measurements over time. The BFWD RMO has been set at 13 for this analysis. In previous analysis of Hankin and Reeves data across the Forest, a BFWD ratio below 13 was found to be indicative of good bank and channel stability. This is being met in most of the surveyed fisheries reaches.

Livestock grazing riparian issues have been addressed through the Border Cluster Grazing EA (2006). Through that EA, riparian fencing was recently installed to reduce cattle trampling and improve adequate vegetative cover on streambanks.

Pools per Mile (PPM)

The INFISH pools per mile RMO is not being met in most fisheries reaches of the project area. It is rare for this standard to be met on the CNF streams.

Direct and Indirect Effects

The proposed action and alternative C would not impact threatened or sensitive aquatic species. No prescriptions are proposed in RHCAs; therefore, these areas would not be impacted. Creeping ground fires may approach RHCAs in accordance with applicable BMPs (Appendix E) and design elements (Appendix C). Large woody debris and large trees would remain.

Road Management

Road reconstruction and use for haul can cause negative effects. Short-term (1-2 years) sedimentation is produced from ditch cleaning, cut-slope rejuvenation for curve widening, culvert replacement, and drainage dip construction, etc. Reconstruction of roads would result in a moderate beneficial effect over the longer term, as sediment production from road templates decreases due to new armoring, drainage structure placement, and revegetation. Many of these roads have drainage problems and are eroding into streams. The reconstruction would stop this, particularly at stream crossings and on roads parallel to streams.

Without dust abatement, riparian road use for haul may contribute sediment into the streams. Cumulative impacts could occur downstream from the Forest Service Boundary. Fine sediment produced mainly from road reconstruction activities would be so small that it would be hard to measure, and is not predicted to affect fisheries or fish habitat.

Closing of unauthorized roads would remove access to riparian areas, however, new road construction and temporary road construction could create additional points of access. Because temporary roads would be obliterated, new roads would be closed upon project completion, and closures would be monitored for two subsequent years following closure, large scale loss of LWD in the RHCA is not anticipated. Some roads that are currently closed would be opened

during the project. Some of these should be gated to limit access into parts of the project area. Since they would only be open during project activities, and effectively closed afterward, it is not anticipated that many snags would be lost, particularly in this planning area where snags (potential LWD) are relatively abundant. This should be successful at protecting LWD in that area.

Vegetation Management

There are no commercial units within the RHCAs. For the commercial harvest units, there would be no effect to trout or INFISH RMOs from harvest activities within individual unit boundaries, except that the risk of stand-replacing fire is reduced. This document incorporates by reference the effects analysis in INFISH for the effects of following the standard and guidelines.

The filtration capacity of the riparian forest floor would not decrease and treatments are not expected to impact flows. For these reasons, it is unlikely that noticeable increases in sediment influxes to streams would be caused by the fuel treatments.

Pre-commercial Thinning (PCT)

Pre-commercial treatments are allowed in RHCAs to promote stand health and large diameter tree growth. It is generally applied to old plantations or treatment units in which trees are thinned with the largest trees remaining. If cattle use is high around a PCT unit within an RHCA, trees would be dropped to form a brush barrier restricting cattle access to streams.

Fuels and Fire Management

The proposed action reduces the risk of stand-replacing fire. One of the major landscape processes in this watershed is fire. Because of past fire suppression efforts, fuel loadings in the watershed are high. This increases the risk of stand-replacing fire both in and adjacent to RHCAs. By reducing the risk, there is a possible beneficial effect to fisheries, INFISH RMOs, and fish habitat from the proposed action.

In limited areas where prescribed fire is allowed to creep into the RHCAs, INFISH Riparian Management standards and guidelines would be followed to attain RMOs and minimize disturbance of riparian ground cover and vegetation. Where the fire enters the RHCA, it would consume small woody debris and leave large down woody material intact. The design elements recognize the role of fire in ecosystem function and would be applied in a manner that does not retard attainment of RMOs, and avoids adverse effects on inland native fish. This should have no effect to fisheries.

Effects of the Proposed Action and Alternative C

There are no proposed vegetation treatment activities within the RHCAs in the East Wedge project area. Road related activities such as haul and reconstruction may occur within the RHCAs, but they, and all activities within RHCAs, would follow the standards and guidelines associated with INFISH. The project activities would not cause degradation that would result in injury or death to bull trout in Lake Roosevelt by significantly impairing either its spawning or rearing habitat in this much larger watershed. This action is therefore not expected to result in a take of bull trout. This project may affect, not likely to adversely affect bull trout or critical

habitat from any of the alternatives. There are no bull trout present within the East Wedge project area, and there are fish barriers that prevent bull trout getting into the project area. There would be no effect to threatened and sensitive aquatic species from the action alternatives.

The effect to RHCAs would be minimal since prescriptions preclude activities within the RHCAs except creeping ground fire; large woody debris would remain and livestock access is not likely to increase.

A low (minimal) amount of sedimentation is expected, but it would not be enough to affect pool quality. Over time, larger trees would develop and pools per mile may increase.

The existing shade level within RHCAs would be maintained so no effect to stream temperature is expected.

Cumulative Effects

Several assumptions were made with regard to future land management activities in these watersheds:

- Farming and cattle grazing would continue at existing levels over the next 5-10 years.
- Timber harvest on private land and State land would continue and would follow State forest practices requirements.
- Road construction on state and private land would continue at decreased levels (compared to the last 20 years) since many areas are already accessible from primitive road systems. Road maintenance on county roads would increase slightly with increasing use by residents and non-residents of these watersheds.
- Private residential development would increase as the county continues to grow, baby boomers reach retirement age, and people decide to live in a rural setting. This trend would be limited by the amount of land available for sale, real estate market conditions, and the overall economy.
- Dispersed recreational use on state and federal lands would increase slightly in direct proportion to population growth in the county and in urban areas such as Spokane.
- Root diseases such as *Armillaria mellea* would continue to infect Douglas fir. This root disease also increases the susceptibility of Douglas fir to secondary attack by bark beetles.
- The Forest Service may respond to insect attacks with some form of management such as timber harvest.
- No changes are expected to Forest Service fire suppression policies in the next 3-5 years (i.e. no let-burn policy with regard to naturally occurring wildfires).

By implementing East Wedge Best Management Practices and design requirements, and overlaying other potential activities, the East Wedge proposed action and alternative C would not cumulatively negatively affect aquatic resources within and below the Forest Boundary. There would be no irreversible and irretrievable commitment of aquatic resources under the Proposed Action or Alternative C. This includes the fish populations, the fish habitat, and the INFISH RMOs.

There are no adverse effects to fisheries from harvest units for the Proposed Action or Alternative C. BMPs, design elements, and mitigations would be in place to prevent erosion from harvest activities within the RHCA. Erosion would be minimal and sediment would not reach levels that would cause a detriment to fisheries.

Wildlife

Introduction

This report presents a summary of the existing condition and effects analysis for the East Wedge Project for management indicator species (MIS), as set forth in the Colville National Forest's (CNF) Land and Resource Management Plan, 1988, as amended (LRMP); US Forest Service Pacific Northwest Regional Forester's list of sensitive species (2008); and federally listed threatened and endangered species. The East Wedge Wildlife report is located in the project file (Newman 2012) and is incorporated by reference.

For each selected species that has habitat present within the project area, this report will cover the key habitat components and/or conditions of concern, and an assessment of the direct, indirect, and/or cumulative effects of the proposed action. The key habitat components/conditions of concern for each species were derived from the applicable standards and guidelines relating to each species as described in the CNF LRMP, and/or other relevant documents. Where appropriate, recommendations of measures to address potential negative impacts and post-treatment monitoring will be identified. Threatened, endangered, or sensitive species (or species groups) are also discussed.

The LRMP sets a series of standards and guidelines to ensure maintenance and improvement of the habitats to support Management Indicator Species (MIS) and the other species the individual MIS are representing. Standards and guidelines for indicator species habitat management are found on pages 4-38 to 4-42 of the Colville National Forest Land and Resource Management Plan (USDA, 1988), hereafter referred to as the Forest Plan. These required measures were intended to ensure that timber harvest and other forest management activities would not lead to the loss of viability of MIS populations.

The Endangered Species Act (ESA) of 1973, as amended, requires that federal agencies analyze the effects of proposed actions on species listed or proposed for listing under the ESA. When necessary, consultation (formal and/or informal) with the US Fish and Wildlife Service will be completed to ensure that actions will have no significant effects on these special status species. The North American wolverine is proposed for listing by the US Fish and Wildlife Service as a threatened species. Analysis of effects to wolverine is included in the EA and project file.

Table 23 lists the MIS, species protected by the ESA, and other special status species within the project area. Each species is discussed in relation to potential effects, with recommendations (design elements) for minimizing any long-term negative impacts.

Table 23. MIS and Special Status Species within the East Wedge Project Area

Common Name	Special Status	Common Name	Special Status
bald eagle	Sensitive ¹	masked dusksnail	Sensitive
barred owl	MIS ²	meadow fritillary	Sensitive
Beaver	MIS	northern bog lemming	MIS
blue (dusky) grouse	MIS	northern leopard frog	Sensitive
bull trout	Threatened ³	northern three-toed woodpecker	MIS
California wolverine	Sensitive	other woodpeckers	MIS
Canada lynx	Threatened	peregrine falcon	Sensitive
common loon	Sensitive	pileated woodpecker	MIS
eared grebe	Sensitive	pine marten	MIS
fir pinwheel	Sensitive	pygmy shrew	Sensitive
Fisher	Sensitive	pygmy whitefish	Sensitive
Franklin's (Spruce) Grouse	MIS	red-tailed chipmunk	Sensitive
gray wolf	Sensitive	Rosner's hairstreak	Sensitive
Great Basin fritillary	Sensitive	sandhill crane	Sensitive
great gray owl	Sensitive	Townsend's big-eared bat	Sensitive
grizzly bear	Threatened	Umatilla dace	Sensitive
Harlequin duck	Sensitive	Waterfowl	MIS
inland redband trout	Sensitive	westslope cutthroat Trout	Sensitive
large raptors great blue heron	MIS	white-headed woodpecker	Sensitive
Magnum mantleslug	Sensitive	wintering big game (white-tailed deer, mule deer, elk, moose)	MIS
migratory birds	MIS	woodland caribou	Endangered ³

¹Sensitive = Regional Forester's sensitive species

²MIS = management indicator species (LRMP 1988)

³Threatened or Endangered = federally listed per the ESA (1973).

Existing Condition, Direct and Indirect Effects

The following species are listed as sensitive for National Forests in Washington, however, they are not expected to occur within the project area because a) suitable habitat is not present, or b) information from the Washington Nature Mapping Program² and vegetation information from Washington Department of Fish and Wildlife³ indicate the project area is outside the known range of these species, except as possible migrants passing through the area. Therefore, the Proposed Action or Alternative C would have no direct, indirect, or cumulative effects associated with Northern Leopard Frog, Peregrine Falcon, Eared Grebe, and Pygmy Whitefish.

Bald Eagle (sensitive)

Bald eagles prey largely upon fish and are usually associated with rivers or lakes. Primary habitat includes clean water with abundant fish populations and large perch trees and roost sites located nearby. In winter and during migration, bald eagles might scavenge in agricultural valleys and wetlands and congregate in winter roost sites found within suitable timber stands (usually mature and/or old-growth timber) located close to an available forage base. Stands that

² The [NatureMapping Foundation](http://naturemappingfoundation.org/natmap/maps/wa/) was established to provide support to the Program and *NatureMapping* Centers, distribute products, and provide services (e.g, bioblitzes, reports, and analyses).

<http://naturemappingfoundation.org/natmap/maps/wa/>

³ <http://wdfw.wa.gov/conservation/gap/>

are suitable habitat within the project area - generally structural stage 6 and 7 - are not proposed for treatment.

Effects

Potential impacts to bald eagles relate to effects to fish-bearing lakes and effects to potential nest and roost sites. RHCAs would not have treatments with minimal exceptions (based on consultation with Fish Biologist and/or Hydrologist: creeping fires). Prescribed fires and thinnings would potentially augment the creation of large trees and snags for roosting across the project area. The removal of small diameter trees and lower limbs would reduce the crowding and competition of trees. This would allow more soil nutrients, sunlight, and water to larger trees, which would grow faster. There may be minimal effects to the bald eagle through either of the Proposed Action or Alternative C. It is expected that this project is not likely to impact this species. There would be no change with the No Action alternative.

Barred Owls (MIS)

Barred owl habitat, which requires large trees, is considered in designated MA-1 stands and low elevation large tree and old growth habitat. Proposed activities within the MA-1 stands are limited to prescribed fire and precommercial thinning (PCT) to remove understory and reduce competition for sunlight, water, and soil nutrients so large trees would grow more quickly. These treatments address smaller diameter stems, so large trees would not be affected. The Proposed Action and Alternative C would not harvest stands that are late seral stage (old growth characteristics).

Effects

The effects of the thinning and prescribed fires at the levels prescribed in the action alternatives would benefit species requiring large trees. Large trees would grow more quickly with the proposed understory thinnings. This would provide for improved conditions for barred owls.

Based on population trends, habitat assessment, and risk factors, the viability outcome is “A” for barred owls on the Forest (Youkey, 2012). Habitat is widely distributed, and risk factors are not influencing habitat occupancy or demographic performance.

Beaver (MIS)

The Forest Plan standards and guidelines specify that beaver habitat will be maintained or enhanced. A general history of beavers in smaller streams in the west consists of a succession of re-colonizing efforts of previously occupied habitat: Beavers exhaust the food resource and move; the vegetation recovers, and eventually a new set of beavers arrives and repeats the scenario.

Effects

Beaver in smaller riparian systems would continue to operate in their historical pattern: colonizing areas, depleting their vegetation, abandoning the area until woody vegetation regrows, and recolonizing the area. Maintaining natural or created vegetation barriers to reduce livestock access to the streams and other riparian areas would help improve woody vegetation

growth within these areas. Livestock management, as discussed in the Big Border Cluster allotment re-licensing documents (CNF 2006), would aid in this as there are natural boundaries within the landscape, and those would be maintained. The proposed harvests and prescribed fires are designed to ensure that these natural barriers are not lost.

Active and inactive beaver dams and workings are in many of the streams of the project area, generally on the sections of stream with low gradients. Many of the flatter sections of the valley bottoms are also the open meadow pastures most heavily grazed by cattle. Cattle can negatively affect beavers by competing for woody vegetation and by physically damaging dams. The Proposed Action and Alternative C are designed to maintain the vegetation around ponds, pools, streams and riparian areas. Minimal activity would occur within the riparian vegetation thereby reducing direct impacts to riparian species needed for beavers to thrive.

Based on population trends, habitat assessment, and risk factors, the viability outcome for beavers across the Forest is “B/C” (Youkey, 2012). Populations and habitat are widely distributed but highly dispersed with some areas contributing lower abundance and isolation. There is opportunity for subpopulations to interact on most the Forest, but some subpopulations are so disjunct or of such low density that they are essentially isolated from other populations. The Washington Department of Fish and Wildlife (WDFW) manages beavers for healthy, productive populations at sustainable harvest levels. The project would not reduce the ability of beaver populations to interact across the Forest.

Blue (Dusky) Grouse (MIS)

The Forest Plan identifies two management elements for blue grouse:

- maintain 8 or more large, limby Douglas-fir or subalpine fir trees per acre on open ridge tops, and
- maintain 50% of the hiding cover around the perimeter of water sources with no break greater than 600 linear feet.

Currently, small ponds on NFS land do not lack cover. The riparian areas in some heavily grazed valley meadows do not support adequate riparian vegetation to provide cover for blue grouse. The vegetation that blue grouse require for hiding in these riparian areas is also marginal (Big Border Cluster Allotment evaluation, CNF 2006). The proposed action and alternative C would maintain the existing condition, which would result in slightly improved conditions in some of the open, heavily grazed riparian areas of the meadows in the valley bottoms. This would slowly improve habitat conditions. As mentioned in the silviculture report (Kaney 2011) there would be no activity within the RHCAs, in compliance with INFISH. As discussed in the silviculture report, design elements (Appendix C), and elsewhere in this EA and project file, roost trees (21 inch diameter and greater) would not be harvested; therefore, there would be negligible impacts to the roosting habitats. This is in compliance with the Forest Plan management requirements for this species.

Effects

The Proposed Action and Alternative C would maintain the existing condition in some of the open, heavily grazed riparian areas of the meadows in the valley bottoms. As mentioned in the

silviculture report (Kaney 2011) there would be no activity within the RHCAs, in compliance with INFISH.

The Colville National Forest is the cumulative effects area. Based on population trends, habitat assessment, and risk factors, the viability outcome for dusky grouse is “B” on the Colville National Forest (Youkey, 2012). Suitable environments are broadly distributed and abundant, but there are gaps with low abundance in some areas. However, the disjunct areas of suitable environments are typically large enough and close enough to permit dispersal among subpopulations and to allow the species to potentially interact as a meta-population. Therefore, the project could improve habitat conditions for dusky grouse and would not contribute to a negative trend in viability of the species across the Forest.

Bull Trout (threatened)

Bull trout are covered in the Fisheries Report (Newman 2012) (summarized in the Riparian Areas and Fisheries section of Chapter 3) and the Biological Evaluation, June 2012.

Wolverine (sensitive)

Wolverines are highly mobile, solitary, wide-ranging animals that utilize a variety of habitat types. They may be found in almost any habitat, but are more commonly associated with boreal woodlands. Wolverines tend to avoid human activities if areas of low disturbance are present. Den sites generally are rocky or in fallen timber in higher elevation areas with steep, inaccessible terrain.

Wolverines use a variety of foods. They have been described as opportunistic omnivores in summer and scavengers in winter. Localized, seasonally abundant sources of food, such as carrion, small mammals and possibly berry patches are important to wolverines.

Existing Condition

Wolverine sightings are reported infrequently on the CNF. Suitable habitat occurs within the project area. The whole project area has habitat for small mammals and big game. In January 2012 Washington Department of Fish and Wildlife (WDFW) biologists captured video of a wolverine on trail camera within the project area.

Effects

Small mammal habitat and big game winter range conditions are the areas of primary importance. Short term effects from the Proposed Action and Alternative C may cause small mammals to move, however, long-term effects may provide for quicker improved conditions for small mammals.

Canada Lynx (threatened)

Canada lynx occupy the boreal, sub-boreal, and western montane forests of North America that have cold, snowy winters and provide a prey base of snowshoe hare, upon which lynx prey almost exclusively. The best available information indicates that overall habitat suitability of

any area for lynx is overwhelmingly tied to the availability of snowshoe hare, their principle prey species, especially during the winter. In Washington, lynx use a mosaic of high elevation forest types, from early successional to mature coniferous and deciduous stands. Use primarily occurs in subalpine fir habitat types between 4,100 – 6,600 feet in elevation where lodgepole pine is a major seral species. In the East Wedge project area, the lynx have not historically followed the convention of the higher elevations, but follow the vegetation habitat types: subalpine fir and adjacent mesic Douglas-fir stands (pers. comm. Holt 2011). Several approaches were made to estimate actual lynx habitat within the project area. These included looking at the combination of stand descriptions (size class distribution, species composition, current stand structure and expected structure post-activities), successional estimations, and elevation. Analysis of lynx habitat focuses on the availability of forage, denning habitat and travel corridors within one or more Lynx Analysis Units (LAUs).

Forage Cover

Forage cover consists of densely stocked regenerating timber stands of sufficient height and species composition (deciduous trees and shrubs or lodgepole pine) to provide food and cover for wintering snowshoe hare.

Denning Cover

Denning cover consists of mature and/or old growth coniferous stands with high densities of fallen logs, usually located on northerly aspects that provide cooler microclimates. The common component of denning habitat is large woody debris, either downed logs or root wads. Den sites found previously in Washington were in mature timber stands dominated by spruce and subalpine fir.

Travel Corridors and Cover

Travel corridors create linkages between foraging and den sites. Corridors are semi-permanent land features (forested ridges and saddles, road edges, riparian areas) or general forest areas containing trees and/or shrubs of sufficient size and density to provide cover for lynx traveling over the landscape.

Current information suggests that lynx might not directly avoid or be displaced by most low-use forest roads. However, roads can still negatively affect lynx by allowing human disturbance in denning habitat and increasing access for incidental or illegal hunting or trapping. Plowing or packing snow on roads or snowmobile trails in winter may allow competing carnivores to access lynx habitat thus increasing competition for prey. The Lynx Conservation Assessment and Strategy (LCAS, 2000) guidelines recommend prioritizing roads for closure or seasonal restriction in areas within LAUs that have a road density of 2.0 miles/square mile or greater.

Non-lynx Habitat

Non-lynx habitat consists of warm, dry biophysical environments or permanent openings within an LAU. Non habitat includes those vegetation types and land conditions which do not support conditions desired by lynx and their prey. These include dry forest types, meadows, true wetlands (not just wet habitat types), gravel pits, mining areas, etc. Based on that definition, there is an estimated 7,800 acres of non-lynx habitat within the East Wedge project area LAUs.

Activities within non-lynx habitat within the LAUs is expected to not impact lynx, so non-habitat will not be further discussed in this document.

Unsuitable Habitat

Unsuitable habitat consists of open areas that at some point could support lynx habitat, but currently do not. These areas do not contain much above-snow vegetation, or the above snow vegetation is far beyond the reach of snowshoe hares. In winter these areas tend to hold few if any snowshoe hare. Sometimes, unsuitable habitat can consist of large blocks of trees that do not support any prey species.

Existing Condition

In April 1993, the WDFW released draft maps showing potential lynx habitat across the state. Within this potential lynx range, subdivisions called Lynx Analysis Units (LAUs) were identified to facilitate analysis of lynx habitat on a smaller scale. LAUs do not depict actual lynx home ranges, they were delineated generally along watershed boundaries, and their size approximates the home range area used by an individual lynx. In November/December 1999, the LAUs located on the CNF were re-examined using new guidelines provided in the LCAS. LAU boundaries were adjusted where necessary to remain consistent with the LCAS guidelines. There are three LAUs within the project area: Pierre, Sheep, and South Wedge.

Approximately 39.4 miles of road occur within the three LAUs (inside and outside of the project area, crossing or adjacent to potential habitat only), equating to an average road density of approximately 0.7 mi/mi². This road density is within the standard (2.0 mi/mi²) described in the LCAS (Ruediger et al. 2000).

There have been unconfirmed lynx sightings in and near the project area. Most of the areas outside of LAUs are not expected to provide suitable habitat for resident lynx, but may be used by lynx to travel between resident areas. Lynx distribution in northeastern Washington has been monitored by the WDFW and the U.S. Forest Service through documentation of winter track sightings, trapping records, camera stations, hair snag inventories, volunteer observations, and incidental sightings. One source indicates that there is no confirmation that lynx are resident to the project area, only that they are present (pers. comm. Holt 2011).

Travel Corridors and Cover

Within the project area there are many streams and riparian areas, drainages, etc. which contribute to the movements of lynx. There are also approximately 39.4 miles of existing low-volume roads through lynx habitat within the three LAUs. Roads are mentioned as edge effect areas, and can also provide travel corridors.

Forage and Denning Cover

Denning habitat is considered to be those stands with LOS characteristics and large quantities of large down wood (structural stages 5 and 6, Kaney 2011). Within the three LAUs, there are approximately 4400 acres of forest (NFS, Washington Department of Natural Resources (DNR), and private lands) considered suitable for potential denning. However, there are no known lynx dens within the project area.

Livestock grazing and timber and fuel treatments have occurred in the past within the project area. Livestock grazing has minimal effect on lynx. Forest practices activities within the subalpine fir and adjacent mesic Douglas-fir habitat types must not exceed 30% within a given LAU, and must not exceed 15% over a ten-year period (LCAS 2000).

Effects

As illustrated in Table 24, the amount of activity within potential lynx habitat by LAU is approximately 30%. These activities are not expected to convert potential habitat to an unsuitable condition for lynx. In addition, activities proposed for piling and burning in lodgepole types to encourage recruitment of foraging cover is expected to improve forage habitat in some areas.

Table 24. Potential Lynx Habitat with Proposed Activities (PA) by LAU

LAU	Total Acres	Potential Habitat*	Potential Habitat with PA	High Quality** Forage	High Quality Forage with PA	Potential Denning***	Potential Denning with PA
Pierre	13592	10462 ac.	4204 ac.	2395 ac.	1557 ac.	763 ac.	6 ac. (1%)
Sheep	13445	12004 ac.	1815 ac.	518 ac.	438 ac.	3816 ac.	<1 ac.
South Wedge	10737	8002 ac.	3217 ac.	1177 ac.	758 ac.	1034.3 ac.	185.1 ac.
Total	37774	30468	9237 ac.	4091 ac.	2753 ac.	5614 ac.	192 ac. (4%)

*Includes all qualities of forage habitat.

**Dense plantation stands that are expected to be habitat for snowshoe hare (primary prey of lynx).

***Those stands in structural stage 6, with LOS characteristics

Effects to Canada lynx would be short-term, as prescribed fire would open ground for more desirable vegetation to feed the primary prey of lynx, snowshoe hare. This would be a benefit. The effects of both the Proposed Action and Alternate C would result in negligible changes to the road density (changes of 10,000ths of a mile).

The proposed action and Alternative C would have effects to potential lynx habitat, however, these are not expected to adversely affect lynx. There would be road work, harvest, prescribed fire, and precommercial thins within the three LAUs of the project area. Overall, the current and potential roading would have a negligible effect on lynx habitat as roads within the project area are not high-volume. Traffic within the project area is well below thresholds of concern described in the LCAS. In addition, activities proposed would allow for piling and burning in lodgepole types to encourage recruitment of foraging cover, which is expected to improve forage habitat in some areas. PCT is planned in non-habitat stands only, which is consistent with the recommendations of the LCAS. Prescriptions were developed to provide long-term improvement for lynx and other species of concern. Prescribed burning is expected to happen during cool weather and moist fuel levels to maintain large woody debris, reducing potential negative impacts to denning habitat. An added long term benefit includes the recruitment of snags to become down large woody debris, maintaining and/or improving lynx denning and snowshoe hare habitat. The risk to lynx is moderate because lynx may occupy the project area,

however, the consequences are low because the proposed action and Alternative C would be consistent with the LCAS.

Roads

The proposed action alternatives would include road reconstruction and new construction of system and temporary roads within the LAUs. At the conclusion of the project, approximately 8 miles of (current and new temporary) roads would be obliterated. This would result in approximately 38.6 miles within potential habitat in the LAUs. Based upon the best science available, the road densities within the LAUs currently and post project are below what is considered levels of concern (>2 mi/mi², Reudiger, et al 2000). In addition, these roads are neither highways nor high volume, nor are they groomed or plowed for winter use, with the exception of the 1500 Road, which has limited recreational traffic in the winter. Temporary roads would be open only to project related traffic.

Unsuitable Habitat

As previously described in the introduction, areas classified as unsuitable are those which have the potential to maintain vegetation types preferred by lynx and their prey, however, currently are not providing those conditions. This could describe mesic stands with stocking rates too low, too short, or too high to provide adequate cover and browse for lynx and hares. However, with time or prescriptions may rebound to provide these conditions. Within the three LAUs of the project there are approximately 766 acres (2% of potential habitat).

Forage and Denning Habitat - Approximately 20% of the potential lynx habitat is designated with Proposed Actions (6600 acres). Most stands with proposed harvest also include some prescribed fire, and the expected changes would result in minimal change to structural stage. The Proposed Action within denning habitat stands (192 acres) are recommended for prescribed fire. The timing of the burning is expected to result in low intensity burns leaving the large wood debris, and in the long-term regenerating the undergrowth. These burns are expected to be set during the cooler fall months, which is after the denning season (described as May through July). There would be no lighting of downed wood greater than 9” dbh. The design elements would ensure a cooler burn that would have no effect on the larger woody debris and root wads. Effects to the Canada lynx would be short-term, as the prescribed fire would open ground for more desirable vegetation to feed the primary prey of lynx, snowshoe hare. However, there would be a 3-5 year window where that vegetation may be lacking sufficient height for winter use by hares. There are no prescriptions within high quality forage.

Table 25 lists the total potential denning habitat per LAU. As illustrated in this table, there would be minimal activity within potential denning habitat by implementing either the Proposed Action or Alternative C.

Table 25. Potential Denning Habitat per LAU

LAU	Acres potential denning habitat	Ac. potential denning habitat w/Proposed Action
Pierre	763 ac.	6.3 ac. (1%)
Sheep	2620 ac.	0.44 ac.
South Wedge	1034.3 ac.	185.1 ac.

*Denning habitat may be more reliant on structure than species, so these numbers are based on structural stage, as described in Newman 2011.

Travel Corridors

Travel Corridors and connectivity would be maintained. There are no planned activities within the RHCAs.

Cumulative Effects

The cumulative effects area evaluated with regard to Canada Lynx within this BE is limited to the portion of the CNF referred to as the “Wedge”. The Wedge’s three LAU’s are isolated to this region (Map B), bound by approximately 6 miles and a river on the east, west, and south. In addition to the East Wedge project area, the Summit-Pierre fuels project area is also in the “Wedge”. These two areas are comprised of approximately 70,000 acres, including private, state, and NFS lands. There are many activities on-going within these planning areas.

The cumulative effects to lynx would include the minimal effects from livestock grazing within the project area. As stated in the Big Border Cluster Allotment Evaluation and supporting documents, there are minimal effects from permitted grazing. The Summit-Pierre fuels project would have no cumulative effects to Canada lynx as there is no lynx habitat within that project area (USFS 2009). There is road maintenance on-going, however, there is very little winter maintenance (limited to NFS road 1500) and no established grooming for snowmobile routes. The roads proposed with the East Wedge project would be closed within 10 years (Cornwall 2011) and use would be limited to project traffic only. Noxious weeds may have an impact to lynx and snowshoe hare, however the control of these plants would likely negate those potential negative impacts.

Overall the proposed action may affect, not likely to adversely affect Canada lynx. (Also see Biological Evaluation 6/2012.)

Common Loon (sensitive)

Loons nest on clear northern lakes and large ponds. They prefer to nest offshore, on islands, islets, or floating mounds of vegetation in shallow water. The nest is usually near deep water so the loon can swim to and from the nest undetected by predators. Because loons rely on sight, clear water is critical for the common loon. In winter, loons migrate into shallow coastal marine habitat. Common loons are threatened by habitat loss, largely due to human disturbance from recreational activity (Rodriguez 2002).

Existing Condition

Common loons are known to nest on some lakes within the CNF. Pierre Lake, outside the project area, had one nesting pair in recent years. The project area contains no large lakes (> 40 acres) or rivers with abundant fish that provide foraging and nesting habitats for loons.

Effects

Although no common loons have been documented within the project area, several small lakes do occur (Elbow Lake, Pepoon Lake, and several beaver pond complexes). Due to the restrictions of activities within RHCAs, there would be no effect to common loons from the Proposed Action or Alternative C.

Fisher (sensitive)

The Forest Plan provides no direction for managing habitat specifically for fishers. However, it addresses the habitat needs of old growth associated species with a forest-wide network of “core” reproductive habitat areas for pine marten and pileated woodpeckers, and a specific management area for barred owls (MA1). Where these reserved areas are located in low to mid-elevation, mesic forest stands, they could also provide essential habitats for fishers.

Research results from the Interior Columbia Basin Ecosystem Management Project (USDA, et al, 2000), and other entities, indicated that existing forest plan management requirements “might not be adequate to ensure long-term species viability” (Lowe, 1995). To address this issue, the Regional Forester issued an amendment to the forest plans of the national forests east of the Cascade Mountains (Lowe, 1995) that provided additional management direction for old growth associated species habitat including direction for habitat connectivity, large tree habitat, and late and old structure habitat.

Fishers prefer landscapes that have a high degree of mature forest cover. There is some evidence that they use habitats based more on the physical structure of the forest, and the prey associated with forest structures, rather than a specific forest type. Good overhead canopy closure, a diversity of tree sizes and shapes, and dead, downed wood are all important components of reproductive habitat (Powell and Buskirk, in Ruggerio, et al, 1994). Large (21”+ in diameter) live and dead trees, and down logs provide habitats for fishers especially for resting, and denning. Late successional stage stands with good canopy closure (structural stage 6) provide the best potential reproductive and resting habitats for fishers.

Effects

The Proposed Action and Alternative C may have beneficial effects for fisher habitat. There would be stumps created in the harvest units, and large trees would be maintained. Fishers are considered very rare in Eastern Washington and their presence has not been confirmed in the project area. There is potential habitat for the species within the project area – late structure forests with high canopy cover, hollow logs, snags, with an ample food source (herbivorous small mammals and birds). The late structure stands within the project area would not be harvested under either the Proposed Action or Alternate C. However some prescriptions may lead to desired habitat conditions.

Cumulative effects would include cattle grazing. However, per the Border Complex biological evaluation (Loggers 2006), the level of cattle grazing in these allotments does not significantly impact the canopy cover, snag component or large woody component that are strongly associated with fisher use. Therefore there would be minimal impact. Long range, both the Proposed Action and Alternative C could lead to improved conditions.

Franklin's Grouse (MIS)

Franklin's grouse habitat is described as large stands of young lodgepole pine, often the result of stand-replacement fires. The Forest Plan directs that large areas dominated by lodgepole pine

stands be managed to maintain 20% of the habitat in young age classes. This species requires high elevation, dense, young (< 20 years old) lodgepole pine forests with scattered mature spruce.

Effects

The various prescriptions for cutting and prescribed fire within the project area may have a short-term impact on grouse. These animals would move during activities. However, the regrowth and emergent vegetation post activity would provide for an increase in forage and cover habitats.

Gray Wolf (sensitive)

The Northern Rocky Mountain Wolf Recovery Plan (USFWS 1987) identifies three areas for wolf recovery: Yellowstone, northwest Montana, and central Idaho; Washington State does not contain any wolf recovery areas. Any wolves found outside recovery areas receive federal protection, though the areas they inhabit are not managed to provide wolf habitat. The USFWS officially removed the gray wolf from the threatened and endangered species list in eastern Washington on May 5, 2011. (Federal Register 2011). The species then became classed as a Forest Service (Region 6) sensitive species for the CNF. Forest Plan direction for wolf management is to investigate sightings and protect any discovered resident animals.

Wolves are closely tied to habitats that support abundant big game populations. Limiting human-caused mortality is a primary management concern. The habitat requirements of the gray wolf are strongly tied to that of their main prey, ungulates, primarily deer. The Proposed Action and Alternative C would improve deer winter range towards meeting the 50%:50% forage ratio, which is in compliance with the Forest Plan.

The Forest Plan, written when wolves did not occupy the Forest, calls for wolf monitoring by recording location and determining validity of reported sightings. Wolf sightings are occasionally reported from throughout the CNF. Biologists conducted call surveys for wolves in the 1980s through the early 1990s, but there were no confirmed responses in any of these surveys. However, wolves now occupy the Colville National Forest and have been documented from the planning area. The Forest Service will manage habitat for wolves while the State of Washington manages their populations.

Effects

Timber harvest and prescribed burning would improve the forage component of big game winter ranges for perhaps 15 plus years. Road densities are expected to remain similar to current conditions. Risk of human-wolf interaction would reduce over time as roads become brushed in. There is no expected adverse effect to gray wolves. (Also see the Biological Evaluation 6/2012.)

Great Gray Owl (sensitive)

Forest Plan (page 4-40) direction for raptors is to “manage the nest sites and surrounding areas to insure their continued usefulness to the respective species”. The Forest Plan provides for old

growth associated species with a forest-wide network of “core” reproductive habitat areas for pine marten and pileated woodpeckers, and a specific management area (MA1) for barred owls. These reserved areas could provide reproductive habitats for great gray owls.

Great gray owls utilize boreal forests and feed primarily on rodents. They favor areas near bogs, forest edge, meadows, and other openings. Open mature and older forests may also be important foraging habitat, especially in winter. Nest site and prey availability appear to be limiting factors for great gray owls. Nests occur most often in mature and older forests. Preferred nest sites are the abandoned nests of other raptors, but it will nest on broken tops of trees and artificial platforms. Nest sites are often reused for several years.

Existing Condition

Potential nesting, roosting, and foraging habitats for great gray owls are present within the project area where there are openings within a forest matrix. There was a great gray owl nesting within the Elbow Lake allotment (Loggers, 2006), which may be still active, as reports to Three Rivers District Biologist suggest a similar location (pers. comm. Loggers 2011). Adults and juveniles have been sighted with East Wedge project area, but actual nest site was not located during surveys.

Effects

No timber harvest or mechanical fuels treatments would occur within 50 feet of wetlands smaller than 1 acre, or within 150 feet of wetlands larger than 1 acre. Prescribed fires would not be planned in these areas. Thus, project effects to these mesic habitats for voles and other prey animals should be insignificant or discountable.

Vegetation management proposed in upland areas would open up forest canopies and allow more sunlight to reach the forest floor. This would stimulate the growth of grasses and other ground vegetation, potentially benefitting voles and other rodents in the short term. Stand canopies and understories would become more open, improving the hunting effectiveness of large-bodied birds such as great gray owls.

There is currently livestock grazing within the three allotments in East Wedge. Livestock grazing does not negatively impact great gray owl habitat (CNF 2006).

The Proposed Action and Alternative C within gray owl habitat may have a beneficial effect on the owl, providing for recruitment of potential nest sites and improved growth within MA-1 areas, all beneficial for this species.

Grizzly Bear (threatened)

The East Wedge project area is not within an identified recovery area for grizzly bear. The project area lies more than 20 miles outside of recovery habitat, and within lands classified as Management Situation 5 for grizzly bears. Grizzlies rarely occur in these areas although some suitable and available habitat may exist. In Management Situation 5 areas, Grizzly habitat needs are not a necessary consideration, but maintenance and improvement of habitats is an option (USDA Forest Service, et al, 1986). In 2001, USFS, DNR, Boise Cascade, and the

WDFW collaboratively conducted a hair-snagging project in the area, with no grizzly bears detected (Loggers pers. comm. 3/2012). In 2011 there were reports of a small population of grizzlies just north of the Wedge in British Columbia (Borysewicz pers. comm. 9/2011). In the spring of 2012, there were documented reports of individual grizzly bears within the Canadian Border Zone (CBZ) of the project area (Loggers pers. comm. 4/2012). It is expected that grizzly bears found within the project area have come from Canada.

Existing Condition

Grizzlies often den in alpine/subalpine areas with deep soils. The project area does not reach high enough elevations, so no denning habitat is available. It is expected that grizzly bears found within the project area have come from Canada.

Spring forage habitats include low to mid elevation riparian areas, meadows, etc. The project area has a considerable amount of habitat, specifically along Corral Creek and American Fork Big Sheep Creek. These areas are in the CBZ on NFS and private lands. Summer/fall foraging sites include mid to high elevation, berry producing shrub fields. Seclusion from human disturbance is a primary management objective.

Effects

The proposed action includes prescribed fire, regenerative harvests, precommercial thins, commercial thins, and temporary increase in road density. The various harvests, thinnings and prescribed fire may benefit grizzly bear in forage availability as these options are expected to provide openings in the understory to regenerate shrubs, forbs, and new tree seedlings. In addition, these prescriptions are working toward maintenance or improvement of habitat for a variety of species which use similar habitats to those used by grizzly and their prey. The riparian areas would remain protected through the project's consistency with INFISH and RHCA design elements.

Cumulative Effects

The cumulative effects area evaluated with regard to grizzly bear is limited to the portion of the CNF referred to as the "Wedge". Grizzly bears have recently been reported in the area (spring 2012) and they occur in Canada north of the planning area. The main threat to bears comes not from timber harvest or activities associated with it but from humans. Timber harvest can be compatible with grizzly bear management because it increases forage, primarily berries, and provides early-successional habitat for prey. Road construction can be compatible if roads are effectively closed to vehicles. Existing and future projects on National Forest System and Washington Department of Natural Resources lands in the area would be planned to be compatible with management for grizzly bears in Management Situation 5. Activities on non-governmental land do not have to follow this direction.

Several projects have occurred in the recent past, especially on the east side of the Wedge on both industrial timberlands, NFS lands (most recently the Hoki timber sale), and on Washington Department of Natural Resources land.

Hiding Cover

Hiding cover throughout the Wedge would probably not decrease dramatically because recent trends in the Forest Service indicate that projects would propose few large regeneration units and instead move to create pockets of smaller openings. Additionally, many regeneration harvest units cut in the 1980s and early 1990s have nearly grown into hiding cover and, depending on the level of precommercial thinning in these units, can provide good hiding cover adjacent to foraging patches. Harvest on non-NFS land continues to create openings that reduce hiding cover, though the extent would not preclude bears from using portions of the cumulative effects area.

Travel Corridors

Most of the potential grizzly bear habitat in the Wedge is managed by the Forest Service, Washington Department of Natural Resources, or, in the eastern part of the Wedge, by various industrial forest owners. The Forest Service adopted guidelines to maintain travel corridors on lands it manages. All current and future projects on NFS land would retain cover on the landscape that would not preclude grizzly bears from moving through an area. On non-NFS land corridors remain, though have been measurably reduced in width along Deep Creek in and just east of the planning area. Analysis by Singleton *et al.* (2002) showed landscape permeability was good to moderate over most of the northern, forested part of the Wedge. The Proposed Action and Alternative C would not negatively affect travel corridors.

Forage

No units were designed to improve forage for bears, though all harvests would increase available forage by improving conditions for big game and somewhat for berry-producing shrubs. Continued encroachment of noxious weeds would reduce palatable vegetation. An active noxious weed control program in the county has used a combination of chemical and biological controls in an attempt to manage noxious weeds, with variable success. Management of wildland/urban interface areas, usually at lower elevations and rarely in riparian areas, would have a minor positive effect to forage conditions. Because many of the urban interface sites are close to roads and people as well as in warm, dry environments, they don't provide good habitat for grizzly bears.

Road Density and Core Area/Secluded Habitat

Reductions in core habitat decrease habitat suitability for grizzly bears, mainly because the greatest threat to bears is that of being shot by a poacher. Little core area exists on non-NFS lands on the south part of the Wedge, and no areas on non-NFS land contain a biologically significant amount. The existing blocks of core area are contiguous with a large chunk of forested habitat in Canada that contains various densities of roads but also supports grizzly bears. Current and future projects that construct or reopen roads would reduce core area habitat for the length of the project.

The Forest Plan requires that new roads be closed at the end of harvest activities, so the most severe negative impacts would be limited to the time during which the roads remain open to vehicle traffic, usually a 3- to 6-year period. While restricting most vehicles, there is the possibility of illegal motorized access on closed roads until the road becomes too grown-over for vehicles to pass. Changes in OHV management on the CNF that restricts OHV use to specific roads and trails (per the Colville National Forest Motor Vehicle Use Map, 2012) would

improve conditions, assuming that people obey the law. Considering bears have not been recorded from the area for more than half a century, the scattered level of harvest and post-harvest activity, and the reduced level of road building than in the past, future projects probably would not result in a loss of core area habitat that would negatively affect grizzly bear movement. (Also see Biological Evaluation 6/2012.) The proposed action may affect, not likely to adversely affect grizzly bears.

Large Raptors/Great Blue Heron (MIS)

The Colville National Forest manages the individual nest trees and nest groves of large raptors and herons to ensure their continued usefulness to these birds (Forest Plan page 4-40). These species are indicators for wildlife that require large tree habitats to complete some portion of their life cycle.

Existing Condition

Pierre Lake, which is outside the planning area, has bald eagles and great blue herons nesting around it. There are several goshawk nests throughout the planning area. Large raptors and great blue heron nest in both coniferous and deciduous trees, though they do not require one type or another. Effects to these birds are measured by effects to potential nest trees.

Effects

Prior to any activities within the 400-acre goshawk post-fledgling areas, where activity is permitted, actions would be deferred until nests are empty. No treatments would occur within the 30-acre nest areas. Proposed actions within the 400-acre post-fledgling areas as deferred are consistent with allowable activities as set forth in the Eastside Screens.

As per the Design Elements live trees greater than 21" dbh would not be designated for removal. Although there would be activity within these areas, the effect is expected to be temporary. With the Proposed Action and Alternative C, there would be temporary disruptions to large raptors and herons but management requirements would be met.

In thinned or selectively harvested stands the overhead canopy would be opened up. Crown bulk density would be reduced. Concealing cover would be reduced in proportion to the amount of tree basal area removed. These effects could last from 10-20 years. Ambush hunters (ex. goshawks) which rely on concealing cover in the forest canopy could experience reduced hunting effectiveness in harvested stands.

Commercial thinning and selection harvest would provide some immediate benefits to large raptors. In thinned stands, these birds would have less "clutter" to negotiate when flying through the tree canopy. Many of the stands in middle and late structural stages are presently so densely stocked they may be avoided by large raptors. Thinning these stands could essentially increase the area that these birds can effectively access.

goshawks - The viability outcome for goshawks is "A / B" on the CNF (Youkey, 2012). Suitable environments are broadly distributed and of relatively high abundance, but there are

gaps where these environments are absent or only present in low abundance. These gaps are typically not large enough to prevent the species from interacting as a meta-population.

The Forest-wide assessment of MIS viability (Youkey, 2012) identified five strategies to improve viability outcomes for northern goshawks across the Wenatchee-Okanogan and Colville National Forests. Three of these strategies pertain to the Colville National Forest and are described below. Also listed are project design elements proposed for the East Wedge project that would make the project consistent with these strategies.

Strategy 2: Restore dry and mesic forest cover types using thinning and/or prescribed fire.

Project design elements: The project would be designed to maintain mesic forest cover types within their HRV, and move stands in dry forest types towards their HRV through commercial thinning and prescribed fire.

Strategy 4: Maintain stands with active goshawk nests in old forest conditions. The Northern Goshawk Scientific Committee recommends three 30 acre nest stands per breeding pair and three additional 30 acre replacement stands within a 6000 acre area that functions as potential home range (Wisdom, et al, 2000, in Youkey, 2012).

Each of the known active goshawk nest stands in the East Wedge Project Area would be reserved from harvest (60 total acres). Any active nest stands discovered during future surveys would be reserved from harvest. Habitat areas for old growth associated species and Riparian Habitat Conservation Areas along streams would not be treated. These reserved habitat blocks would be well dispersed across the project area and would exceed habitat levels recommended by the Northern Goshawk Scientific Committee.

Strategy 5: The species is a high priority for monitoring on the Colville National Forest due to the strongly negative trends in source habitat availability and the unknown effects of dry-mesic forest restoration on their habitat use and productivity.

Project design elements: The wildlife biologist monitors all known goshawk nest stands across the ranger districts each spring, with emphasis on those stands within active or recently completed timber sale areas.

Based on this discussion, the project is consistent with Forest Plan direction (as amended) and continued viability of large raptors is expected across the Forest.

Migratory Birds (MIS)

Migratory birds were not selected as Management Indicator Species during the development of the Forest Plan, nor is there direction in the Forest Plan to manage habitats specifically for landbirds. In September of 2000, the USDA Forest Service Landbird Strategic Plan was issued. This plan provided direction to assess and disclose the effects of forest management on landbirds, in environmental documents. On January 10, 2001 President Clinton signed an executive order outlining responsibilities of Federal agencies to protect migratory birds.

Interest and concern over the status of several individual species, and migratory land birds as a group, has increased considerably because populations of several Neotropical migratory bird species have declined. These declines are most apparent for some grassland species and eastern forest-dwelling species. Factors thought to be responsible (Smith, 2000) include:

- habitat loss and fragmentation on wintering and breeding grounds,
- predation,
- cowbird parasitism, and
- pesticide use.

Long-term monitoring of migratory birds in the western US indicates that the main area of concern relating to forest management is habitat fragmentation. The areas of concern related to forest management are habitat alteration or loss due to exotic species invasions and habitat alteration due to fire suppression. The Proposed Action and Alternative C would not include pesticide application and would not measurably change the predator suite. A study investigating cowbird parasitism, conducted in similar habitats southeast of the project area, indicated cowbird parasitism to be insignificant (Beutler 2000). These factors will not be further addressed.

Flammulated owls benefit from the retention of snags and other trees with cavities, which is integral to this project. Calliope hummingbird, Olive-sided flycatcher and Cassin's finch are fairly common in the project area or in northeastern Washington and would benefit from the project. Calliope Hummingbirds use edges and forest openings and respond positively in the short term to logging. Olive-sided flycatchers often use areas that have been logged, which are superficially similar to post-fire stands. Willow Flycatchers occupy willow thickets and other brushy areas near streams and wetlands, and clear-cuts and other open areas with nearby trees or brush. Cassin's Finches prefer open forests and they use selectively logged forests and small-scale clear-cuts. The concern for them lies at lower elevations, where developments or agriculture creates better habitat for House Finches.

Direct & Indirect Effects

Timber harvest, prescribed fire and other activities associated with the East Wedge project would affect several of the migratory birds that occur on or near the CNF. Activities affect each species differently and at different levels (individual, population, community and landscape), the response being driven by the interaction of each activity's timing, intensity and extent with each individual's mobility and escape strategies, and a species' population size and habitat requirements.

Impacts to migratory birds will be assessed on an alternative's effect on overall habitat conditions within the project area. Generally, projects that improve riparian shrub and deciduous tree conditions, or promote the future development of large tree, single stratum (SS7) habitat would provide improved nesting and foraging opportunities for the land bird species of greatest concern (USDI Fish and Wildlife Service 2008). Proposed management activities (timber harvest, prescribed burning, non-commercial treatments) have the potential to affect other migratory land birds, both positively and negatively.

The Proposed Action and Alternative C may affect a small amount of habitat relative to the overall ranges of the birds that use the environments that occur in the area, but none would measurably impact riparian areas.

Treatments within the SS6 stands are all prescribed fire. The underburning would enhance the movement of these stands towards SS7, manage the area to stand conditions more in line with historic ranges of variability in stand structure and would enhance habitat for species that depend on open stands of large trees.

Prescribed fire in the Proposed Action and Alternative C would, aside from destroying a few nests during the spring underburning season, improve habitat conditions for those species that occupy more open sites. Depending on timing, the prescribed fire could kill a few individual nestlings but would not result in a decrease in the population of any birds.

In the precommercial thinning units, habitat for those species that prefer dense, younger stands would decrease, though suitable and sufficient habitat remains on the landscape so that these species would not exhibit a population decline. None of these species are considered threatened by habitat loss and none are on any lists of species of concern.

The Proposed Action and Alternative C provide opportunities to restore under-represented habitat (especially SS7) via prescribed fire, maintaining openings and shrub-fields via prescribed fire, and promoting healthier, more resilient forest conditions across the planning area.

Cumulative Effects

Within the East Wedge planning area, migratory land bird habitat conditions have been affected by a wide variety of management activities. The majority of valley floors privately owned have been converted to pasture or hay fields that benefit those relatively common species that depend on open habitats but may have contributed to the overall decline in Cassin's finches. Forest Service management does not convert forested lands to pasture so this project would not contribute to cumulative effects to Cassin's finches. Fire suppression has reduced much of the habitat diversity that occurred across the East Wedge area when fires actively burned, especially on the lower elevations of the planning area. Livestock grazing occurs on public lands; however most of the forested riparian conditions remain fairly good.

The cumulative effects of these activities have been proportionally greater in those habitats that historically have been transitory in nature and/or in limited supply such as openings, shrub-fields, riparian habitat, early successional forests, and single stratum forest types than in the general coniferous forest environment. Current and future management activities that maintain or improve these types of habitats contribute cumulatively to the perpetuation of bird species that require these conditions and the maintenance of the area's bird species diversity. Activities that do not maintain or improves these habitats do not contribute cumulatively to maintenance of existing habitat and species diversity.

The East Wedge project would initiate both immediate and long term improvements in several priority habitats for landbirds. Additional large tree habitats would be promoted through stand

stocking control. Up to 79 percent of the dry site, multi-storied stands with large trees (SS6) would be moved towards single story, late and old stand conditions (SS7) through stand stocking control. The intent would be to restore the ecological function / historic condition of these stands. The risk of destructive, stand replacing fires would be reduced across the project area. Based on this discussion, the project would meet the intent of the Conservation Strategy for Landbirds in the Northern Rocky Mountains of Eastern Oregon and Washington (Altman, 2000), and continued viability of landbird species across the Forest is expected.

Northern Bog Lemming (MIS)

Northern bog lemmings inhabit a variety of wet habitats, usually in alpine or subalpine areas. There are no high-elevation bogs in the project area.

Effects

There would be minimal effects to this species from either action alternative because there are no high-elevation bogs in the East Wedge project area. This is compliant with the management requirements for this species.

Northern Three-Toed, Pileated, and White-Headed Woodpeckers and Other Primary Cavity Nesters (MIS)

Under the Forest Plan, woodpeckers as a group were selected as Management Indicator Species (MIS) to represent snags and the species that depend on them. Snags and cavity trees were recognized as a special habitat component that could be dramatically influenced by planned management programs. Two woodpecker species, pileated and northern three-toed, were also named individually as MIS representing other species within specific timber stand conditions. White-headed woodpeckers are primarily associated with more open stands of mature and old growth ponderosa pine and mixed conifers and are relatively sensitive to habitat manipulation.

Originally, the Forest Plan established management objectives, expressed as habitat capability for woodpeckers, as maintenance of habitat (existing snags and green replacement trees) capable of supporting 60% of potential populations within areas where timber is harvested and 100% of potential populations everywhere else on the Forest. The Forest Plan recognized that snags may have to be created in some areas to meet this direction. This direction was subsequently changed by the Eastside Screens amendment (1994) to provide snags and cavity trees capable of supporting 100% of potential populations within all areas of the Forest.

To ensure that these habitats are maintained across the landscape, the Forest Plan established a hierarchical “grid” system consisting of Management Area 1 (old growth), Pileated Woodpecker management requirement areas, and Pine Marten and Northern Three-toed Woodpecker management requirement areas. Analysis of the effects to birds that create cavities in trees (primary cavity nesting birds) is done by examining the impacts to live and dead trees. The Proposed Action would not impact these species because large live trees (>21” dbf) and snags (>16”) would be left on site. In addition, the silviculturist and biologist have minimized activities within the pileated management areas, per the CNF LRMP amendments requirements, reviewing potential escape and travel routes, and designed prescriptions to minimize disruptions

to these species. Harvest and fire activities proposed in the areas were designed to no more than one third of the management requirement areas.

Effects

Although Pileated woodpeckers occur in suitable habitat outside the designated MA 1 and MR areas, the establishment and maintenance of desired conditions within MA 1 and MR areas was considered sufficient to provide for these species across the Colville National Forest and the established standards and guidelines for managing these areas provides an effective baseline for evaluation of the existing conditions and expected effects of alternatives on these species across a broad landscape. No harvest activities are proposed for the MA 1 core area, because scheduled timber harvest is not allowed in MA 1 areas.

The effects to the cavity nesters are expected to be minimal. The birds would not be isolated from other areas with the ability to fly considerable distances. Activities within these areas have been planned to not isolate the birds or impact more than approximately one- third of their management requirement area, as described in the LRMP.

Harvest would cause a short-term loss of standing snags but a long-term improvement in condition of the area for pileated woodpeckers. Additionally, by removing the understory and mid-story trees and opening the stand, the condition of the habitat immediately improves for white-headed woodpeckers, which glean on live trees rather than snags.

The Forest Plan established a network of areas across the Forest designed to retain and promote the development of late and old forest habitat conditions that would provide habitat for barred owls, pileated woodpeckers, pine marten and northern three-toed woodpeckers. It recognized that these habitat conditions could not be provided or maintained everywhere within a managed forest landscape and that some suitable and existing habitat areas could be impacted by management activities. This network was designed to ensure the retention of suitable amounts of habitat, well distributed across the Forest, to provide for these species over the long term.

Under the current Forest Plan, the Colville National Forest has been quite successful in protecting and managing these MA 1 and MR areas across a broad landscape. Implementation of the direction contained in the Eastside Screens (1994) is also helping insure that these habitat areas remain interconnected to facilitate species movement across the landscape. All these measures are designed to reduce any cumulative negative effect of management activities on barred owls, pileated woodpeckers, pine marten and northern three-toed woodpeckers and their habitat Forest-wide.

Presently, the Colville National Forest manages source habitats for old growth associated species based on the concept of Historic Range of Variability (HRV). By managing habitat within the HRV, it is assumed that adequate habitat would be provided because species survived within that range of habitat levels in pre-settlement times. If current habitats are managed within the range of historic variability, an adequate job of ensuring population viability for old growth associated MIS would occur (Landres et al, 1999).

pileated woodpeckers - The viability outcome for this species is “C” on the Colville National Forest (Youkey, 2012). Suitable environments are distributed frequently as patches and/or exist at low abundance. Gaps where suitable environments are either absent or present in low abundance, are large enough for some populations to be isolated, limiting opportunity for inter-specific interactions. There is opportunity for subpopulations to interact over most of the Forest. NFS lands in the East Wedge Project Area are contiguous to other NFS lands to the west which contain source habitats. Thus, pileated woodpeckers in the project are not isolated from neighboring populations.

The Forest-wide assessment of MIS viability (Youkey, 2012) identified four strategies to improve viability outcomes for pileated woodpeckers across the Wenatchee-Okanogan and Colville National Forests. Three of these strategies pertain to the Colville National Forest and are described below. Also listed are project design elements proposed for the East Wedge project that would make the project consistent with these strategies.

Strategy 2: Manage those watersheds with habitat condition 2a and 2b primarily for the restoration and protection of source habitat. This may include thinning young stands to accelerate the development of older forest structure.

Project design elements: See the discussion under Strategy 3 for pine marten.

Strategy 3: Identify and protect existing pileated woodpecker cavity trees/snags during any prescribed burning or harvesting activities. This may require lining or racking the base of the tree/ snag prior to burning.

Project design elements: Green trees exhibiting pileated woodpecker cavities would be reserved from harvest. Large diameter trees / snags would be protected during logging operations, to the extent feasible. Trees / snags with cavities would be lined or otherwise protected during prescribed burning operations.

Strategy 4: Manage access to reduce the negative effects on pileated woodpecker source habitat, including the loss of snags and downed wood.

Project design elements: See the discussion under Strategy 5 for pine marten.

The East Wedge project should have insignificant or discountable impacts to large diameter trees, snags, and down logs at the scale of the Colville National Forest. The broad intent of forest management proposed with the project would be to move the area closer to the HRV for stand structural stages, and closer to the historic fire regime. Thus, we expect this project, when combined with other forest management projects proposed or underway on NFS lands, would not reduce the population of old growth associated MIS, or threaten their viability across the Forest.

Three-toed: The Interior Columbia Basin Project (ICBEMP) analyzed the historic and present availability of habitats for primary cavity excavators, including northern three-toed woodpeckers (Wisdom, et al, 2000). The assessment process used by ICBEMP was based on

using the concept of Historic Range of Variability (HRV) to assess the likelihood of maintaining viable populations of species. By managing habitat within the HRV, it was assumed that adequate habitat would be provided because species survived within that range of habitat levels in the past. The Colville National Forest has been managing to meet the HRV within stand structural stages since the mid-1990s (Lowe, 1995). If current habitats are managed within the HRV, it would result in an adequate job of ensuring population viability for three-toed woodpeckers across the Forest (Landres et al, 1999).

Based on population trends, habitat assessment, and risk factors, the viability outcome for the three-toed woodpecker is “C” on the Colville National Forest (Youkey, 2012). Populations and habitat are widely distributed, but highly dispersed with areas exhibiting lower abundance.

Pine Marten (MIS)

In the Forest Plan, pine martens and several other terrestrial wildlife species are identified as Management Indicator Species (MIS) representing old and mature stand structure habitat. Due to their small size and relative range of mobility, they are considered one of the most important indicator species for mature and old-growth forests.

Identification of existing conditions and analysis of the effects to pine marten habitat was done by examining mesic large tree and old growth stands (large tree habitat), marten and pileated woodpecker MRs, MA1 areas, and travel corridors.

Pine marten primarily inhabit mature and old-growth forests. The Forest Plan (pages 4-39, 4-40, 4-69 through 4-72) provides for a network of “core habitat areas” to meet the reproductive habitat needs these species. Core habitat areas are spaced more or less evenly across the forest in a grid pattern. The estimated acreage of a breeding female pine marten home range is 160 acres, with a preference of contiguous quality acreage. Research suggests that pine martens also require dead and down material for foraging, cover, and denning. Within pine marten management requirement areas, the minimum down material requirement is 6 logs per acre; a minimum of 2 hard snags per 160 acres, with a minimum diameter of 12”; and a crown closure minimum of 50%.

Effects

Pine marten are affected by changes in canopy cover and downed wood. Recruitment of replacement downed woody material is expected where fire is proposed. The only large live trees (21”+) that would be harvested anywhere in the project area would be those standing within new road and equipment corridors, and log landings.

The main concern for connectivity is that pine marten in one management requirement area would not be completely isolated from other management requirement areas. The proposed action alternatives would not preclude the pine marten from moving into adjacent management requirement areas via more than one route so they would still be expected to move through or around proposed burned and harvested areas (J. McGowan 10/2010). Little long-term negative impact is expected from the Proposed Action or Alternative C. Also see effects discussion under Primary Cavity Nesters.

The viability outcome for pine marten is “B / C” on the CNF (Youkey, 2012). There has been a reduction and fragmentation of old forest habitats in the cool/moist forest group in the medium /large trees family, from historical conditions. Marten populations have been negatively affected by roads in source habitats. There is also a concern that the risk of fire spread from dry forest habitats to source habitats for the species is increasing. These trends have resulted in a lower probability that populations are viable, and the likelihood that they are well-distributed in only a portion of the Forest.

The Forest-wide assessment of MIS viability (Youkey, 2012) identified seven strategies to improve viability outcomes for martens across the Wenatchee-Okanogan and Colville National Forest (CNF). Three of these strategies pertain to the CNF and are described below. Also listed are project design elements proposed for the East Wedge project that would make the project consistent with these strategies.

Strategy 3: Efforts should be made in watersheds with habitat condition 3 to maintain and restore current habitat value in source habitats.

Project design elements: The project would not contribute to cumulative effects to source habitats in the subalpine fir / spruce biophysical zone. No stands meeting the North Idaho Zone old growth definition would be harvested in any biophysical zone. Source habitats would be maintained where they exist within designated core habitat areas for old growth associated species, known nest stands of northern goshawks, and Riparian Habitat Conservation Areas.

Outside of the areas mentioned above, some source habitat stands would be thinned or selectively harvested. Timber harvest would not convert these stands to earlier structural stages, although overhead canopy and crown bulk density would be reduced. The intent of partially harvesting these stands would be to maintain them in their present structural stages over time. If left untreated, these stands could eventually revert to an earlier structural stage, due to insect and disease occurrences, or the lack of a younger cohort (age class) of trees.

Within all harvest units, large diameter green trees (21+ inches), snags (16+ inches), and down logs (14”+) would be protected to the extent that equipment operation and worker safety allow. Additional large tree habitat would be promoted through stand stocking control (commercial thin / selection harvest). Fire risk in source habitats would be reduced through the reduction of surface and ladder fuels across the landscape.

Strategy 5: Removal of snags and/or coarse woody debris through firewood gathering or silvicultural practices should be prohibited or discouraged in source habitat for American martens because it diminishes the value of a stand as source habitat.

Project design elements: Large diameter snags and down logs would be protected during logging operations to the extent that equipment operation and worker safety allow.

All new road access proposed for the project would be kept closed to the public.

Strategy 6: Fuel loads should be reduced in dry forests by restoring historical stand structure and composition in areas where dry forests with high fuel loads lie adjacent to source habitats. This action would potentially help keep fire out of source habitats.

Project design elements: Within the East Wedge project area, acres thinned or selectively harvested would open up the stand understories, reduce fuel ladders, and move these stands towards a more historic fire regime. Where these stands lie adjacent to source habitats, the risk of fire spread into the source habitats would be reduced.

Townsend's Big-eared Bat (sensitive)

The Forest Plan does not contain specific standards and guidelines or management direction pertaining to Pacific western (Townsend's) big-eared bats. The objectives are to protect internal microclimate conditions of mines, caves and structures associated with roosting, hibernating and/or reproducing bats and to protect roosting, hibernating and/or reproducing bats from human disturbance. Management intent is to minimize or eliminate disturbance at hibernating areas (from mid-October to May) and maternity colonies (approximately May through August). To determine effects to Pacific western big-eared bats, we examine effects to sites that support hibernacula and maternal colonies (caves, mines, old buildings). They may also utilize snags in the summer. Big-eared bats feed in or over a variety of habitats.

Townsend's big-eared bats have been found in mine adits and caves in the project area. A large site is within the Churchill Allotment (Loggers 2006) of the Project area.

Effects

These habitat conditions are not affected by the Proposed Action or Alternative C. There are no recommendations for mine adit closures, cave gating, or removal of historical buildings on NFS lands within the project area. Harvest would open stands and presumably improve foraging conditions for Townsend's big-eared bats. Therefore there should be minimal effects to this species from any of the alternatives.

The area considered for cumulative effects analysis consists of the Wedge between the Kettle and Columbia rivers. Planned projects and treatments on other ownerships within the Forest boundary could contribute to cumulative effects to Townsend's big-eared bats because private landowners are not required to manage for these bats and old buildings can be modified or destroyed.

Forest Service timber treatments in this and other projects would not negatively contribute to cumulative effects to either hibernacula or maternity sites because we buffer maternity colonies and conduct prescribed fire and timber projects near mines outside the hibernation period.

Sandhill Crane (sensitive)

Sandhill cranes prefer open grasslands and isolated freshwater marshes that are surrounded by shrubs and forests. They also can be found in expansive grasslands, wet marshy hay meadows or burned-over aspen stands in grass succession with several small pools of shallow water or

streams. Nest sites are usually marshes, bogs, or swales. An important characteristic of a nest site is the presence of standing water with emergent aquatic vegetation. Cranes will, however, nest on dry land. They prefer to be far from human habitation (Harris 2000).

Sandhill cranes occasionally are observed flying over or resting on the CNF, but have not been documented as nesting in the project area.

Effects

The project area has no isolated, large tracts of marshes and wet meadows that are more than ¼ mile from open roads. Therefore, there would be no effects to the sandhill cranes from any of the alternatives.

Big Game (MIS)

Winter range is a limiting factor for big game (ungulates: deer, moose, and elk). The CNF LRMP specifically lists mule deer west of the Columbia River and white-tail deer east of the Columbia River. The project area has both species.

Winter range is the most limiting habitat for deer and/or elk. The maintenance of adequate quality and quantity of food and cover resources is an essential part of providing useable winter range habitat for deer and elk on the Colville National Forest. Equally important is the maintenance of adequate levels of habitat security during the winter months, when human-caused disturbances can cause deer or elk to use their stored nutrient reserves at higher than normal rates, with potential adverse effects on winter survival rates and fawn/calf survival. Therefore, the analysis of effects of management activities will be focused primarily on these winter range habitat conditions. The objective with winter range is to move toward a 50:50 ratio of forage and cover habitats. Forage habitat is considered within crown closure of less than 50% and cover habitat ranges from 50-60% crown closure. This requirement is applied only to those management areas classified as winter range (MA6 and MA8).

Habitat security and cover in summer range areas are not considered to be limiting factors. Food availability determines the condition of animals as they enter winter conditions and an emerging body of evidence suggests that late summer forage conditions could be as important, or more so, than forage on winter range (Cook *et al.* 2004; Cook *et al.* 1996). There are no Forest Plan standards and guidelines specific to summer range habitat conditions for deer and elk.

Across the project area there are five MA6 areas, totaling 1,065 acres and eight MA8 areas totaling 5,698 acres. The proposed action and Alternative C prescribe PCT, prescribed burning with variable (spacing) harvest, prescribed fire, and some other treatments over 2,162 of the 6762 acres combined addressing 31% of the winter range.

Effects

Expected outcome of proposed actions would result in the forage:cover ratio in MA 6 approaching 49%:51% (currently 46:54) and MA8 approaching 53%:47% (from 46:54). The road densities currently, and with each proposal, are expected to be very low (Table 26). There

would be increases in road density, however, they are very small and should have negligible impact upon ungulates. This project would be consistent with the Forest Plan.

Table 26. Overall Road Density (mi/mi²) in MA6 and MA8 by Alternative

Management Area	Current/No Action	Proposed Action	Alternative C
MA6 (1065 acres)	2.6 mi – 1.6 mi/mi ²	2.6 mi. – 1.6 mi/mi ²	2.6 mi – 1.6 mi/mi ²
MA8 (5698 acres)	13.4 mi. – 1.5 mi/mi ²	15.7 mi. – 1.8 mi/mi ²	13.6 mi – 1.5 mi/mi ²

Based on population trends, habitat assessment, and risk factors, the viability outcome for deer across the Forest is “A” (Youkey, 2012). Populations and habitat are widely distributed and risk factors identified are being managed. The Washington Department of Fish and Wildlife is managing deer and their habitat to ensure healthy, productive populations at sustainable levels.

Woodland Caribou (endangered)

Woodland caribou are managed under a recovery plan approved by the USFWS in 1993. The East Wedge Project area is located more than 20 miles outside of a woodland caribou recovery area and does not contain suitable woodland caribou habitat. However, woodland caribou have been seen in the Churchill Mountain area. Therefore, habitat in the project area is not needed for the survival and recovery of the species. This species will not be discussed further herein. (Also see the Biological Evaluation 6/2012) There is no effect to this species from the action alternatives.

Sensitive Invertebrates

It is expected that there would be little impact to these species from the Proposed Action or Alternative C. Essential habitats such as wetlands and streamside riparian areas would likely benefit from activities associated with the proposed action alternatives (masked dusksnail). Design Elements would ensure that riparian areas associated with lakes, ponds or streams are not negatively impacted.

Meadow fritillary is associated with higher-elevation meadows and openings. No particular management considerations are thought necessary on federal lands at this time. Records of Great Basin fritillaries all lie south of the CNF boundary. Open habitat occurs in the planning area, but presence of this species within the project area is not expected.

Rosner’s hairstreak occupy the mid- and upper-levels of western redcedar canopies and find nectar in nearby forest openings. Harvest would retain large cedars and not affect riparian areas in which most cedars in the project area are located.

Fir-pinwheel are often found in or near talus or under fallen logs. They seem to prefer moist sites, low on slopes or near persistent water sources, but outside of floodplains. Magnum mantleslugs can be found in rock talus, deep duff, or large woody debris generally associated with subalpine fir plant associations. There would be no effect to species associated with talus slopes as no activities are planned in those habitats. No commercial activity is proposed within high-elevation subalpine fir habitats.

Summary of Effects

The Proposed Action and Alternative C are not expected to affect sandhill cranes, pacific big-eared bat, common loon, and gray wolves so there would be no cumulative effects to these species.

Other species found within the project area may be affected by the various activities resulting in short-term negative impacts that are outweighed by the long term benefits of improved forest health, reduced over-crowding, and reducing potential for catastrophic wildfire. Following the Forest Plan, Design Elements and BMPs, there would be no cumulative effects for MIS, sensitive and threatened and endangered species.

Since no activities are planned in the RHCAs and INFISH would be followed, conditions within the RHCAs would improve or be maintained resulting in no negative cumulative effects to riparian dependent species, northern bog lemming, beaver, etc. By meeting these requirements, the project is in compliance with the Forest Plan (and amendments, 1988).

Noxious Weeds

Introduction

This section addresses the prevention of weed spread and the compounding of weed problems that could result from proposed activities. It does not address the treatment of existing weeds or the spread of weeds that would occur independently of the proposed action or alternative. Treatment of existing noxious weeds within the planning area is addressed in the CNF Integrated Noxious Weed Treatment Environmental Assessment (1998) and supported by the Pacific Northwest Region Invasive Plant Program Environmental Impact Statement and Record of Decision (2005a).

The CNF utilizes an integrated pest management approach to controlling noxious weeds. Noxious weed treatments have primarily focused on herbicide application, but cultural, mechanical and biological control methods have also been employed.

Direct and Indirect Effects

Priority Weed Species

During sensitive plant species surveys in 2010, several noxious weed species, hoary alyssum (*Berteroa incana*), sulphur cinquefoil (*Potentilla recta*), and hawkweed species (*Hieracium* sp.), were identified. These are listed as Class B weed species. Class B designate species require control; and Class B non-designate species must be controlled if found in vehicle corridors, buffer strips, and areas of limited distribution. Control of Class B species is also encouraged in areas of large infestations. In order to minimize the risk of noxious weeds becoming established, it is critical that the planning area have noxious weed treatment prior to ground disturbing activities, seeding of disturbed sites as soon as possible after the activity is complete, and post-disturbance noxious weed control treatments to prevent new infestations from establishing.

Of the several noxious weed species present within the planning area the precise abundance is not known due to the annual fluctuations in the populations. Most of the infestations do not occupy large areas and are often just a few plants at scattered locations within the planning area. Noxious weed populations within the East Wedge area are mostly associated with forest roads, past log landings, and skid trails. Roads and trails are areas of disturbance with bare soil which is susceptible to noxious weed establishment, and they act as source areas from which vehicles may spread them.

Disturbed Ground

Existing dense forest canopy on undisturbed timbered sites provide a natural deterrent to noxious weed invasion. Noxious weeds are not generally shade tolerant, although some species can inhabit areas with moderate shading. Within harvested units, noxious weed establishment first occurs on skid trails and log landing sites, in part, because of exposed mineral soil and adequate sunlight. If left untreated, infestations that begin in these locations can spread throughout the harvest unit given that timber spacing would be greater and more sunlight would reach the forest floor.

Commercial thinning, road construction/reconstruction and machine fuel break construction have the highest risk for noxious weed establishment because there is the greatest likelihood of ground disturbance caused by equipment or concentrated use. New road construction, road reconstruction and road decommissioning involving ripping or recontouring create large and often continuous areas of disturbance where nearly all native vegetation is removed and mineral soil is left exposed. Disturbed areas create a seedbed readily susceptible to noxious weed invasion. Within the planning area, there are 79 miles of proposed temporary and new system road construction, reconstruction or decommissioning, which has the potential to become infested.

Underburning and pile burning pose a slight risk to noxious weed establishment. Given the types of fuel treatments proposed for this project it is expected that exposure of mineral soil due to fire would be widely scattered, the areas of bare soil would be small in size, and re-colonization by native plants would occur rapidly. Timing of underburning and pile burning can affect noxious weed spread if done after wind-blown seeds have reached maturity. Seed can be carried in upslope winds and smoke columns produced by the fire. If units are treated with prescribed fire in the spring prior to plants producing mature seed, risk of noxious weed transport would be reduced. Burning in the fall would favor desirable cool season plants and would enhance vegetation recovery.

Since noxious weeds are often spread by motorized vehicles, effective road closures and/or decommissioning are very important in limiting the extent of noxious weed infestations. Temporary roads and those scheduled to be decommissioned and/or closed would need to have effective closure methods employed to ensure that vehicle traffic cannot access these areas. Design Elements include monitoring of road closure effectiveness for five years after closure.

Design Elements for the action alternatives are either specific to prevent noxious weed spread, or indirectly work toward this goal. Winter logging to reduce soil compaction would result in less bare soil being exposed, thereby reducing the creation of new noxious weed habitat.

Requiring equipment washing and revegetation of disturbed sites (as per Regional direction and Forest guidelines) would directly reduce the risk of noxious weed establishment. Pre-treatment of noxious weed populations along haul routes prior to project implementation is required to reduce seed sources. By adhering to BMPs practices under the CNF Weed Prevention Guidelines, noxious weed populations are not likely to spread substantially and could decrease. A decrease in the total number of acres infested with noxious weeds could be realized due to control efforts and mitigating measures within the planning area (see Design Elements, Appendix C).

Rock Sources

There are three existing (Big Iron, Mineral Mtn., and Pierre Creek) and two inventoried sources (Easter [Hard Rock] and Deep Creek [Glacial]) within the planning area and one existing source (Snowcap) southwest of the planning area within a distance of less than 15 miles. Since the material from rock pit sites would be moved to many of the forest roads in the planning area, there is potential risk to spread noxious weed seeds to areas that are currently noxious-weed free. Pits would be surveyed and treated for noxious weeds as part of the on-going Forest-wide noxious weed eradication program. Aggregate material containing viable noxious weed seed would be treated according to management practices 3.9 and 30.3 of the *Colville National Forest Noxious Weed Prevention Guidelines*. This would keep viable noxious weed seeds mixed with the surface aggregate within the existing infested area and not allow it to be placed in areas of road construction or reconstruction.

Vehicle Use

Noxious weeds may be spread within the planning area through any vehicle use. Logging equipment may transport weed seeds onto NFS lands from outside sources. Requirements found in the Colville National Forest Weed Prevention Guidelines and the Regional Forester's 2005 Forest Plan Amendment Preventing and Managing Invasive Plants for management of noxious weeds are designed to minimize this risk. In addition, follow-up monitoring is included to further assure limiting the spread of noxious weeds from activities associated with this project.

Alternative C also includes authorizing OHV use on Forest Road 1500. This may provide additional sources for introduction of noxious weeds on NFS roads. The potential impact is expected to be minimal because OHV's are currently transported along this road to reach existing authorized OHV travel routes. In addition, weed treatment may still occur under the Forest Plan Amendment Preventing and Managing Invasive Plants if any new infestations are found.

Cumulative Effects

Noxious weeds would not likely be eliminated as a result of the activities and efforts proposed for this project, nor by the continued Forest noxious weed treatment program. Noxious weeds have occurred within the planning area for many decades and the Forest has been treating noxious weed populations in the area since approximately 1992. New noxious weed threats continue to advance onto FS lands as they have for many decades and the Forest continues to treat these areas based on priority. Road maintenance and user activities would continue to

create bare soil and bring new weeds to the area. Because there will continue to be access to the planning area by roads to the south and east, noxious weeds can be brought in by forest visitors from areas where treatment may not be occurring.

Range

Introduction

Grazing use occurs in accordance with allotment management plans which are developed for each allotment. The grazing permit defines the authorized number of livestock, pasture rotation and use periods, and discusses range improvements. Grazing use also occurs in accordance with annual operating instructions which are developed prior to each grazing season. The annual operating instructions define the annual authorized number of livestock, pasture rotation and use periods, and discusses range improvements.

Direct and Indirect Effects

Allotments

There are three grazing allotments (Hope Mountain, Churchill Mountain and Elbow Lake) wholly or partially within the boundary of the East Wedge planning area. Grazing within these allotments occurs in correlation with the allotment management plans that have been established for each allotment. The grazing season generally begins on June 1 each year and extends into fall with seasons ending between September 30 and October 31. According to past monitoring information, grazing use is occurring at acceptable levels and within the specified use levels.

The proposed action and alternative C would allow permittees to continue grazing at current levels with greater economic returns due to improved forage availability and presumed greater calf weight gains. This in turn would help maintain the local grazing industry, the ranching lifestyle, and the local economy.

Certain areas within grazing allotments are more suited to supporting livestock use, and therefore areas within allotments have been evaluated and classified as either primary rangelands, secondary rangelands or transitory rangelands. These areas differ in both quality and longevity of use to cattle for forage.

Primary Range

Primary rangelands are areas considered to be naturally un-forested where vegetation is comprised primarily of grasses, secondarily of shrubs, and few trees. Primary rangelands are characterized by having deep rooted, cool season, perennial grasses. Many of the traditional primary range of open grasslands and park-like stands have not been influenced by recent wildfires and are being lost due to tree and shrub encroachment. To some extent this loss has been offset by even-aged timber harvest practices of the 1970s and 1980s; transitory range that is reaching the end of their use to livestock.

Prescribed fire has the potential to increase the quality of the primary rangelands within the planning area by removing encroaching conifer trees and reducing shrub cover. However, burning these areas in the late spring and early summer could result in higher rates of mortality on desirable grass species since the plants would be actively growing and attempting to produce seed at these times. Fall burning would favor dominant cool season perennial plants. Impacts to herbaceous vegetation from prescribed fire are expected to be light with minimal damage to roots because burn plans aim to create cooler fires and so prevent burning down to mineral soil. Therefore, established forage grasses are expected to be adequately recovered by June 1st when the grazing season begins for the allotments. Increased forage and foraging areas for livestock would result from the vegetation and fuels treatments defined in the proposed action.

Prescribed fire also has the potential to impact or complicate range and livestock management by displacing animals. Implementation of the action alternatives is not expected to require grazing deferral or adjustment of grazing rotation systems. Prior notification and planning with grazing permittees regarding prescribed fire would reduce the potential for problems in range management on the affected allotments.

Transitory Range

Transitory rangelands are areas that supply grazing forage for livestock for a period of time, but are not permanent. Transitory range is created where thinning and other fuel treatments open dense forests allowing light to reach the forest floor and herbaceous vegetation to grow. Logged forests can produce much more forage than un-logged forests. Transitory range may also be created along roads and skid trails where reseeding (palatable species preferred per permittees request) takes place to reduce noxious weed invasion. Typically these rangelands exist for approximately 10 to 30 years depending on when canopy closure is reached. Transitory rangelands that would be created by the East Wedge project would likely have beneficial results to grazing for closer to 30 years given precipitation amounts and forest types present. Most of the created transitory rangeland would be in the non-riparian upland areas; therefore, they would act to attract livestock away from riparian areas by providing quality foraging areas in the uplands, thereby contributing to greater weight gains of livestock.

Range Improvements

Livestock management is accomplished in part by range improvements that exist within each grazing allotment. These range improvements include such items as fences, water developments, corrals, and exclosures. Range improvements are critical for the implementation of sound livestock management; they encourage and support livestock grazing in acceptable areas and provide for resource protection.

All potentially affected range improvement projects would be documented and specified for protection on timber sale maps and burn plans (see Design Elements, Appendix C). Any range improvement projects located within the planning area would be protected from damage that may occur from activities described in the proposed action and alternative C. Any private fences near the Forest boundary would be protected from damage during implementation of the proposed activities.

Natural Barriers

Allotments and pastures are separated by a combination of fences on NFS land, privately-owned fences, and natural barriers. Natural barriers consist of areas that are too steep or rocky for livestock to cross and areas of dense timber. Cattle do not typically venture into dense timber because of the lack of forage. Therefore, these areas work well to contain livestock in desired areas without the need for a continuously fenced perimeter. Dense stands of timber function well until the point they become compromised due to vegetation treatments or wildfires. The vegetation and fuels treatments in the proposed action and alternative C have the potential to compromise some natural barriers.

Transportation System

Past road construction activities have generally been beneficial to range management by providing access to construct water developments and fences and manage livestock. Roads that are near range improvement projects provide a way to get supplies to improvements and aid in project maintenance activities. Having roads within grazing allotments also allows permittees to distribute salt to livestock, check on the location of livestock and bring livestock onto and off of allotments with greater efficiency. Roads can also act as routes for trailing livestock between pastures. Both open and closed roads aid permittees in the management of their allotments.

The amount of road construction and decommissioning proposed by the East Wedge project would not likely alter range or livestock management. Road decommissioning is to occur on 7.8 miles of closed Forest roads within the planning area. The roads proposed for decommissioning do not access areas of rangeland improvement projects. Road decommissioning from this project is not expected to result in an impact to livestock management since proposed decommissioning is in portions of active allotments that have other adequate access routes. Roads proposed for construction in the proposed action would have no impact to livestock management because they are not providing additional access to range improvements and would be closed to motor vehicle traffic following completion of the project. Alternative C would not construct any additional system roads.

Cumulative Effects

There would be no cumulative effects to the range resources in this area. Past timber harvest has already recovered adequately to provide little, if any, additional transitory range or impacts to natural barriers. Other activities such as recreation and mining have no impacts on the existing allotments. Past road construction activities have generally been beneficial to range management by providing access to water developments and fences. Roads that are near range improvement projects provide a way to get supplies to improvements and aid in project maintenance activities.

Sensitive Plants

Introduction

No federally listed threatened or endangered plants or plants proposed for federal listing are known to occur in the East Wedge project area (USDI FWS 2007 and 2009). Forty-five plant species listed on the Regional Forester's Special Status Species List (2008) are documented or suspected for the CNF. There were three species found at new locations in the planning area during the 2010 surveys: scalloped moonwort (*Botrychium crenulatum*), kidney-leaved violet

(*Viola renifolia*), and Maryland snakeroot (*Sanicula marilandica*). The full text of this report is available in the project analysis file (Wooten 2012).

Data Collection

A detailed botanical survey was conducted within the East Wedge project area, in sites proposed for ground-based mechanical treatment (about 9,907 acres). The survey protocol was based on USDA Forest Service rare plant survey methods (USDA 2008, Whiteaker 1998). The goal of the surveys was to survey each unit with planned ground disturbance sufficiently to locate rare plant sites. Based on the surveys, appropriate protective measures were designed to avoid any direct treatment impacts and to mitigate potential indirect effects. Surveys conducted in 2010 were visited twice within each unit; once for early emerging species and again in the summer for species that are identifiable later in the season. Surveys conducted in 2011 were visited once in the fall while the vegetation was still green and identifiable. The 2011 surveys mapped all areas within 150 feet of wet areas or potential habitat to be excluded from all ground-disturbing activities as recommended by Forest Botanist Kathy Ahlenslager.

Rare plant surveys were conducted along proposed new or temporary roads in 2011. Protective measures for road impacts to sensitive plants are addressed in Appendix C - Design Elements.

Prior to visiting the field area, pre-field surveys were conducted to develop search criteria and to plan survey routes within the survey area. Existing literature and known plant locations were provided by the Forest Service Botany staff. This data was reviewed and used to generate field maps and a target plant list. The table of rare plant species documented or suspected on the CNF is located in the Botany Survey Report in the project file. Approximately 283 species of vascular plants were identified during the surveys.

Surveys also included revisits to about a dozen previously identified rare plant habitats as part of the regular monitoring program for rare plant species. Approximately 750 additional acres were surveyed in 2011 along with approximately 6 miles of new roads and 3.75 miles of temporary roads for sensitive plants and their habitats, including wetlands and perennial streams. No sensitive plants or their habitats were found in any of the units during the 2011 surveys. However, several areas of potential plant habitat were found along the surveyed roads.

Gravel pits or expanded gravel pits that are planned for use on this project were not surveyed because they have already been surveyed for sensitive plants.

In addition to rare plant locations, data was collected for the following elements: locations and descriptions of high-priority habitats (riparian areas and wetlands not on maps, high quality habitat indicators of large cedar or rattlesnake fern *Botrychium virginianum*), old growth forests, notable wildlife sightings, cultural resource locations, mines, and selected noxious weeds including hoary alyssum (*Berteroa incana*), sulphur cinquefoil (*Potentilla recta*) and any species of hawkweed (*Hieracium* sp.).

Surveyors visited 203 out of 210 treatment units within the Analysis Area during the 2010 and 2011 surveys. Seven treatment units (292 acres) judged as unsuitable habitat for sensitive plants

were not visited. These units were in dry habitats dominated by dense understories of Pacific ninebark (*Physocarpus malvaceus*) or by upland closed-canopy stem-exclusion forest.

Potential for impacts are most likely for sensitive plants that occur within 150 feet of project treatment. These plants include scalloped moonwort (*Botrychium crenulatum*), kidney-leaved violet (*Viola renifolia*) and Maryland snakeroot (*Sanicula marilandica*). These species are all discussed further in this section. Several other sensitive plant species that occur within the analysis area were judged unlikely to be impacted; these were all located further than 150 feet from unit boundaries.

Table 27 identifies stands within the project area that have potential to impact sensitive species. See Appendix C, for recommended design elements.

Table 27. Stands with Potential to Impact Sensitive Plants

Stand No.	Sensitive Species ¹
2390007	BOCR (new EO)
2400048	BOCR_026_2
2430002	BOCR_024
2430029	SAMA_006_1; SAMA_006_3; VIRE_026_1
2440053	BOCR_012_1
2440075	BOCR_013_2; BOCR_013_(new subpopulation)
2440079	BOCR_013_2; also large meadow complex or rare plants to the south
2440097	BOCR_12_1
2440098	BOCR_12_1
2470176	VIRE_(new EO)
2490046	BOCR_067_(new subpopulation)
2490048	BOCR_067_(new subpopulation)

1. Plants are coded by their 4-letter abbreviation (BOCR = *Botrychium crenulatum*; SAMA = *Sanicula marilandica*, VIRE = *Viola renifolia*). The second number after the code is the Element Occurrence number, the label for tracking populations within Washington. The third number after the code is the subpopulation number.

Scalloped Moonwort

The ecology of scalloped moonwort (*Botrychium crenulatum*) begins with its identity as a fern that has requirements for dense shade, organic soil that often has a duff layer, moist soil conditions that may be synchronized with seasonal water table changes, freedom from extensive competition, freedom from soil compaction or excavation, and the presence of mycorrhizal associates. Mycorrhizal associations are sensitive to the health of other mutualist partners including fungi and nearby trees that are connected to the ferns via their roots. Red cedar is the most frequently observed woody associate. The association depends on very specific, but poorly understood soil and moisture requirements that may involve chemical cues. Scalloped moonwort is tolerant of minor soil disturbances that do not penetrate to mineral soil or cause compaction or burial deeper than an about an inch.

Kidney-Leaved Violet

The ecology of kidney-leaved violet (*Viola renifolia*) includes requirements for partially to completely open overstory canopies, muck, sphagnum or silty soil, cool wetland or riparian environments, moist to saturated soil conditions during the spring, freedom from extensive competition, stable hydrologic regimes that are free from scour, and possibly co-occurrence of mosses. The presence of logs or rocks that may provide shade and moisture within microsites is also common. Kidney-leaved violet is apparently tolerant of moderate ungulate trampling, but is probably unable to compete with aggressive competitors introduced and favored by ungulate grazing.

Maryland Snakeroot

The ecology of Maryland snakeroot (*Sanicula marilandica*) includes a preference for closed or partially open canopies, partly organic soils that may also contain a substantial mineral content, thermal cover provided by woody species, moist to saturated soil conditions. Maryland snakeroot is apparently tolerant of moderate competition and moderate ungulate browsing. It is widely distributed in small populations on the CNF; these may be limited by seed production, seed dissemination or germination limitations.

Purple Avens

Purple avens (*Geum rivale*) was reported growing with another sensitive plant, kidney-leaved violet (*Viola renifolia*) in a site on the east fork of upper Pierre Creek. Plants were scattered along the forest margin of the streambanks. The identification of this species is tentative, based on characters of emerging purplish-tinged upper leaves that were in dense, sharply pointed, sharply folded clusters. This plant is similar in habitat and gross appearance to largeleaf avens (*Geum macrophyllum*). When these plants were seen, they lacked distinguishing characters of purple sepals and nodding flowers. Plants with these characters were not seen in later visits to the area, although largeleaf avens was seen in the area. Habitat for purple avens include wet meadows, bogs, riparian zones along perennial streams, pond edges and moist old pastures, from 2,500 to 6,400 feet elevations. Environmental factors affecting the viability of purple avens may include greater tolerance or even preference for sunlight exposure.

Direct and Indirect Effects

Direct impacts to plants from project activities are possible, but unlikely, since the project was designed to exclude sensitive plant populations from areas with activities with, in most cases, 150-foot setbacks from ground-based mechanical treatments. This setback is already established for all activities proposed adjacent to riparian areas in the project area.

Types of indirect impacts that could occur include the following:

- Decreases in canopy cover beyond the plant's ability to withstand sunlight exposure.
- Decreases in canopy cover that dry out habitats.
- Increased cattle access to previously secluded habitats due to clearing forest cover and road building.
- Increased uncontrolled off-road vehicle use.
- Hydrologic changes from the use of temporary and skid roads.

- Changes in sediment transport due to the use of temporary and skid roads.
- Increased recreational camping or partying.
- Spread of noxious weeds and introduced forage species as a result of management activities.
- Increased competition by species released by treatments.
- Increased competition by species planted for mitigation, i.e., roadside planting of aggressive grass seed mixtures, or seed mixtures contaminated with other species.
- Increased non-target damage from herbicides used as a management mitigation measure.

Direct impacts to sensitive plants during road construction, reconstruction or road maintenance are unlikely, other than minor impacts from dust from hauling, since no sensitive plants sites are located on open project roads. Recreational impacts are generally minor within the project area.

Increased and changed livestock movement patterns can occur as a result of this project. In uplands, this project would have a slight benefit for sensitive plants by helping to distribute cattle into upland areas where forage species benefit from more open canopies.

In most of the sites visited, there were no weed infestations imminently threatening sensitive plant sites. Several other noxious weed locations were provided on GIS to the Forest Noxious Weed Coordinator.

If controlled burns are located only in upland areas with all firelines constructed manually or along existing road prisms, then additional rare plant surveys can be skipped for those areas. See project file and Appendix C - Design Elements - for recommendations for mitigating impacts to sensitive plants.

Where roads are already infested with noxious weeds, construction activities could spread these weeds. Therefore all roads would be surveyed for Washington state Class A and B Noxious weeds. If long-term soil cover is at risk of weed infestation, revegetation would be done with certified Washington State Noxious Weed-free seed. In cattle grazing areas, pasture grasses should be avoided for revegetation mixes. All revegetation mixtures should be certified Washington State Noxious Weed-free.

Herbicide treatments can cause direct harm to sensitive plants and their habitats. Plants growing below roads may be impacted from runoff or drift. Surveys for noxious weeds would be done prior to treatment applications, and applications would only be applied where necessary based on surveys and outside of riparian areas. Where herbicide treatments are planned they would avoid sensitive plant locations.

Past and present grazing has caused both direct and indirect impacts to sensitive plants. Where grazing is occurring in areas infested with weeds, the weeds can indirectly spread to sensitive plant sites.

Cumulative Effects

The cumulative effects address the effects of past, on-going and reasonably foreseeable future activities in combination with the direct and indirect effects of the proposed action. The major

past actions that have affected sensitive plants and habitats have been mining, logging, road building, grazing, and wildfire suppression.

The effects of mining have primarily been indirect through road construction. Direct effects of mining are minor in comparison to the amount of available rare plant habitat.

The effects of logging have primarily been indirect through changes in stand structure that have changed stand conditions for sensitive plants. The results of this project would be to improve habitats for sensitive species that benefit for more open stands, e.g., *Sanicula marilandica*. However logging would be excluded for 150 feet from sensitive plant habitat and this would benefit species requiring denser canopy and older tree structures.

Wildfire suppression is expected to continue into the foreseeable future on the Colville National Forest. Wildfire suppression has cumulative effects on plants due to changes in understory and overstory density and composition. Most of the sensitive plants near the impacted project area benefit from late-seral stand structures. However, stem-exclusion stands are poor habitat until the stand self-thins. Fire suppression can cause an increased risk of crown fire. Sensitive plants in the project area primarily occur in moist to mesic stand types where patchy burns and longer-frequency crown fires are normal. Currently these stands are still within the main fire interval for the next stand level crown fire.

Recreation

Public comment is monitored and reviewed to determine if changes have occurred over time to the values placed on these landscapes since Forest Plan approval. Issues specific to the recreational values of the East Wedge project area, taken from the public scoping documents, include concerns that road management in proposed action would reduce/change motorized recreation opportunities. The following summarizes the East Wedge Project Recreation Effects Report (Shields 2011) that is located in the project file.

Direct and Indirect Effects

Motorized (OHV) Recreation

The proposed action and Alternative C would both decommission 7.8 miles of existing roads, all of which are closed to motorized vehicle use on the 2013 Colville National Forest Motor Vehicle Use Map, Northwest Area (MVUM). However, decommissioning of these roads may preclude future opportunities for OHV trail development without more in-depth planning. Alternative C changes the motorized use of Forest Road 1500 to allow OHV use along this road. This would provide additional OHV access and allow the opportunities for extended and loop routes within the planning area.

Existing levels of illegal OHV cross-country travel and closed road use would likely continue within the project area. Illegal OHV use may actually increase in units where management activities open up the stands adjacent to Forest System roads or leave temporary roads and skid trails accessible from open Forest System roads. While closure devices and management signing has been somewhat successful in reducing the

volume of illegal use, these actions are based primarily on enforcement and engineering. Additional management tools based on education and providing high quality riding experiences within the project area may also help reduce existing and future levels of illegal OHV use. Law enforcement as well as citizen reports would continue to be used to contain illegal OHV use as well as retain legal user's positive experiences.

While some road decommissioning would occur, overall recreation use of the planning area is not expected to be altered by the proposed action because decommissioned roads are only those that are already closed to motorized vehicles. Alternative C is expected to increase OHV opportunities by providing access from the east side of the wedge to the west side as well as access along that road to other roads authorized for OHV use.

Dispersed Recreation

Impacts to fishing, swimming, picnicking, berry picking, hunting, sightseeing, hiking, stock use, mountain biking and other dispersed recreation opportunities relying on the general forest area would be limited to the immediate area where harvest and burn activities are proposed, be of relatively short duration (1-2 year), and should not result in any long-term adverse effects to those recreation opportunities. Short-term impacts would include dust, noise, smoke, congestion from additional commercial traffic, loss of access to favorite use areas, and possibly road closures. Long-term, there should be an increase in visual variety within the planning area resulting from an increase in large trees, with more visible shrubs, forbs, and grass. Berry picking, hunting, and wildlife viewing may improve within the project area after overstory and understory trees are removed, providing for better vision into the forest and decreased competition for sunlight, nutrients, and moisture by the remaining vegetation. Likewise, sightseeing should also improve as scenic views are opened up and visual distance into the forest improves.

There may be a reduction in the availability of firewood following harvest and burn activities in the planning area that would exist until some of the residual trees begin to die.

Impacts to winter recreation opportunities within the project area should be limited to periods of active winter logging only. After harvest and burning activities are completed, winter recreation opportunities within the project area would return to current conditions.

The proposed action would add approximately six miles of road to the Forest Service Road System which would be placed in Level I status (closed to motor vehicles) upon completion of management actions. This may enhance some non-motorized dispersed recreation opportunities (i.e. berry picking and hunting access would improve, potential for mountain biking and skiing, etc.) within the project area as recreationists utilize the new routes to gain easier access to portions of the forest that previously had no road or trail access. Alternative C would not add any roads and therefore would have the same impacts as the No Action alternative.

Cumulative Effects

The cumulative effects area associated with the East Wedge project for recreation resources other than Potential Wilderness Areas (PWAs) includes lands within the East Wedge

planning area as well as those NFS lands within the Summit Pierre area west of the East Wedge planning area. This area represents the area of potential impact to recreation resources associated with the East Wedge project. The areas surrounding this boundary are state and private properties. Almost all opportunities for camping, trail use, motorized OHV recreation, and dispersed recreation are on National Forest System lands in this area.

At this time, there are no known planned timber harvest activities on non-National Forest System Lands. West of the East Wedge planning area is the Summit Pierre timber sales. Activities related to these sales are expected to continue until approximately 2015. Past timber sales in the project area are complete and would not impact recreational opportunities in the East Wedge project area since they do not overlap in time.

The Pacific Northwest Trail is proposed as a National Scenic Trail. The proposed route goes east to west from Glacier National Park (Montana) to Neah Bay on the Pacific coast of Washington. While the final route had not been determined, a portion of the proposed route crosses through the East Wedge planning area.

Additional impacts (noise, dust, congestion due to commercial traffic, loss of access to favorite dispersed campsites) to camping along Forest Road 1500 would result during completion of the Summit Pierre Timber Sales if the harvest from that project is hauled to the east. Most of the hauling for this activity is scheduled to travel west and would not impact these activities within the East Wedge area. This project is scheduled to be completed by 2015 and the East Wedge project is estimated to start in 2013 so there is a potential for a two year overlap in operations. These impacts would be of short duration.

- Because there are currently no developed trails within the East Wedge project area, there would be no cumulative effects to trails.
- OHV use may result in additional impacts (erosion, noxious weed spread, loss of native plants) from illegal cross-country travel and the use of closed roads associated with management activities.
- Other than the small possibility that some hauling traffic from Summit Pierre may cross the planning area, there should be very little cumulative impacts on dispersed camping from this project.

The Proposed Action is consistent with the Forest Plan management area prescriptions for dispersed recreation, trail, and off-road vehicle use within management areas 1, 5, 6, 7, and 8. Proposed activities would meet Forest Plan standards for dispersed recreation, trails, and off-road vehicles.

Visual Quality

Introduction

The CNF manages visual resources according to Visual Quality Objectives developed through the Visual Management System (USDA Forest Service 1974), and further specified in the Forest Plan, which allocates management areas that guide resource management activities on NFS lands. The Visual Management System has recently been updated by Landscape Aesthetics, A

Handbook for Scenery Management (USDA Forest Service 1995, revised October 2000), and otherwise known as the Scenery Management System (SMS).

Direct and Indirect Effects

Visual Quality Objectives

The Existing Visual Condition of the East Wedge planning area ranges from a landscape where changes are not visually evident to the average person unless pointed out, to landscapes where changes are noticed by the average forest visitor, but they do not attract attention. The natural appearance of the landscape dominates. Visual Quality Objectives (VQO) are given to each management area in the Forest Plan.

For both action alternatives, the scenic integrity and the valued landscape character would be retained, and the proposed activities would be consistent with the Forest Plan objectives. The planned activities are anticipated to retain existing conditions.

Concern Level Routes

Concern Levels are a measure of the degree of public importance placed on landscapes viewed from travel ways and use areas. For this planning area, the existing condition as viewed from Concern Level One and Two locations is consistent with the valued landscape character and meets current VQOs. There are no concern level 1 viewing locations in the planning area. The one Concern Level Two location is County Road 4220 (Sheep Creek Road) – Highway 25 to Elbow Lake.

Canopy Fuel Treatments

Management activities related to logging vary in their intensity and the various types of logging systems create differing effects in the landscape. Ground-based logging systems, because of the flexibility of the operation, can produce harvest openings of varying size, shape, arrangement, and edge effect. The primary concern is soil disturbance and the potential for introducing line and color contrast where corridors or skid trails are perpendicular to the line of sight. As the ground gets steeper, or in some cases where the line of sight is from a higher vantage point, the potential for introducing visible contrast in color or line increases. Skyline (cable) logging systems generally have less flexibility due to system requirements, and therefore greater potential for creating visual changes to the landscape character. The change in crown closure and stand composition related to age classes are primary factors in how visible these effects would be regardless of logging system used.

With reasonable vegetative recovery durations, the proposed action and Alternative C would meet the Forest Plan-directed VQOs from concern level two area and by management area for Retention, Partial Retention, and Modification. After treatments are done, scenery enhancement is expected over the following 10 to 20 years (varies by species, location and the related environmental conditions). This would help to achieve scenic desired conditions.

Commercial thinning activities proposed in the middle ground and background distance zones would remove enough of the forest canopy to create textural changes, but usually not exposing the ground surface to viewers due to foreground screening, topography, and overstory retention.

Post action effects as viewed in foreground units where group selection harvest is proposed may have a short-term effect of 10-20 years due to the evidence of logging practices. Where shelterwood, thinning and selection harvest are proposed, layout and marking would break-up any potential or existing contrasting “straight-line effects” visible in foreground units where possible, and adjacent to private ownership lands. Textural changes in the vegetation due to tree spacing, small group selection openings and other proposed canopy and fuel ladder reduction treatments would create positive effects.

After a short duration of one to three years to repopulate the herbaceous plants, shrubs and grasses, other foreground units would meet the desired VQOs. Proposed treatments in the units with dead and dying trees, or densely forested stands, would be positive and enhance the landscape scenic condition. Treatments would increase the diversity of the landscape and provide more open stands granting “visual penetration” into the forested landscape. Large-bole ponderosa pine, western larch, and Douglas-fir are highly valued scenery components that would be retained on the landscape. With the removal of small trees and other materials from around them, they would be highlighted scenic features in the forests.

Especially in the foreground and middle ground viewing distance zones, larch and aspen trees are valued for dramatic fall displays of color. Where possible, aspen would be retained, and in all stands larger western larch would be managed for long-term forest resilience.

Road Management

There would be some limited short-term and minor impacts while immediate vegetation (grasses and other herbaceous materials) re-populate the cut and fill slopes, ditches, and other disturbed areas. With the completion of the proposed activities, there would be more open stands along roadways, which could result in a more scenic traveling experience. Where treatments occur lower in the landscape, such as along creeks, even broader, more scenic views would be exposed.

Underburning and Pile Burning

The VQOs as defined in the Forest Plan are not well suited to the temporary effects of underburning. The goal of the Visual Management System has been to strive to maintain a natural-appearing landscape. Since fire is a natural occurrence, prescribed under-burning is consistent with a natural-appearing landscape. Since post-burn mortality of trees due to prescribed fire ranges from about 10% in most areas, and up to 35% in some selected mixed fire regime treatments, effects would vary. Again, depending on the viewer’s background, some of the results may be perceived as visually negative impacts.

Underburning would blacken tree trunks, low branches, and the ground. The effect in the foreground can be highly visible immediately following the burn, but lessens as scorched foliage drops and under story vegetation becomes re-established. The visual effects of under burning are usually minimal to the casual observer in five years or less. Hanging “orange-red” dead conifer needles due to some inherent scorching can be considered a visual impact by some. This is a short-term duration result; normally the needles fall within one season. To some extent, dead needles can be considered to mimic the naturally occurring dead and dying conifers due to

drought and pest effects which add to the scenic complexity and diversity of the broad scale Forest landscape.

As viewing distance increases, the visual effects become less evident. From the middle ground viewing distance, it may be possible to see some widely scattered black or “orange-red” tree crowns, the result of trees killed during the proposed burning. From the background viewing distance, little to no visual effect should be discernable. The results from underburning would help to maintain and enhance scenic diversity in the long-term.

Hand pile and machine pile activities have the potential to scorch nearby trees or tree limbs, and would leave a blackened area on the ground where the pile burned. What would be seen are scattered “orange-red” dead foliage on conifer trees, and spots of blackened earth. It is expected that the visual effect would only last for a few seasons, until scorched needles fall and vegetation becomes re-established in burned spots.

Proposed burn areas would be seen in a variety of Forest multi-use and multi-purpose access roads where the visual quality objectives range from Retention to Modification. While there would be short-term noticeable changes, an intact healthy, more open, natural appearing landscape is expected to further long-term VQOs and be consistent with Forest Plan Standards.

Cumulative Effects

Key areas where visuals are a concern could have a cumulative impact along the Sheep Creek road due to past harvest activities. However, most of the previously harvested areas have essentially recovered so the cumulative effects would be minimal.

Heritage

Introduction

Heritage resources are the physical remains of sites, structures or objects used by humans in the past. They may be historic, prehistoric, archaeological, or architectural. Prehistoric refers to anything that predates written history. Historic refers to that period for which written records exist. The following discussion is a summary of the East Wedge Cultural Resources Inventory Report (Coyote, 2011).

Data Collection

Field reconnaissance was conducted during the field seasons of 2010 and 2011 by an archaeological field crew consisting of two archaeologists and two archaeological field technicians. The planning area was stratified into high, medium and low probability zones based on the Forest’s Inventory Design for Heritage Resources. All high probability zones (3,414 acres) were surveyed in transects not greater than 20 meter intervals. Fifty-four percent of medium probability (2,378 acres) and nineteen percent of low probability zones (9,108 acres) were surveyed in transects not greater than 25 meter intervals. Shovel scrapes were conducted in area where mineral soils were not visible at least every 20 meters on each transect. A total of approximately 14,900 acres were surveyed. Inspections were made of disturbed areas such as root wads and road cuts.

Previously known historic properties were relocated and re-recorded. Newly discovered and re-recorded historic properties were recorded using Washington State Department of Archaeology and Historic Preservation site forms.

Direct and Indirect Effects

Known Sites

Very few prehistoric sites have been located within the CNF, but research indicates prehistoric use of uplands. Small hunting camps, tool manufacturing areas, rock shelters, graves, pictographs, trails, vegetable processing sites, and religious sites may exist within the Forest. The most common recorded sites for the East Wedge area are historic sites, which include mines, mining camps, logging camps, wagon roads, splash dams, Civilian Conservation Corps camps, and early Forest Service Administrative sites (abandoned fire lookout towers and old FS trails). There are no known Native American cultural resource sites on NFS lands within the planning area.

In order to comply with the requirements of Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800, the CNF contracted with Stevens County Conservation District (SCCD), and provided funding for the Confederated Tribes of the Colville Reservation (alternatively the Colville Confederated Tribes [CCT]), to conduct a cultural resources study. The purpose of the study was to document the presence or absence of potentially significant cultural resources located within the East Wedge planning area. The study consisted of background research, a Traditional Cultural Property (TCP) overview, and an archaeological investigation that included pedestrian surveys. The CCT History/Archaeology Program conducted the cultural resources study in September 2010. All cultural resource survey work done for this project meets USFS standards for Section 106 reporting, following a USFS inventory design. Recorded sites were flagged with a 5-10 meter buffer, and would be avoided during treatment activities.

Records held at the Washington State Department of Archaeology and Historic Preservation (DAHP) and the CCT History/Archaeology Program indicate that no less than seventeen (17) archaeological sites have been previously recorded within or adjacent to the area of potential effect proposed for the East Wedge Project. Ten (10) of the sites are not eligible for listing on the National Register of Historic Places (NRHP) and seven (7) of them have not been evaluated.

Seventeen (17) previously recorded sites were revisited within East Wedge project blocks. However, two (2) of the revisited sites could not be relocated. Two (2) other sites were not revisited as the area of potential effect surrounding these sites were changed to precommercial thinning (PCT) stands and were deemed unnecessary for cultural resource inventories (Coyote 2010:13-14).

No TCPs were identified within the APE during the overview, and six (6) new sites – all mining related - were recorded. Eligibility under the NRHP was not assessed but left to the CNF for determination. However, historic properties that are unevaluated are managed by the CNF as if

eligible, and mitigations for these properties would follow management prescription as specified.

All sites located within the East Wedge planning area are considered Management Class 2: Not Evaluated. The management prescription for Class 2 sites is that the property must be protected and preserved as if eligible, and must be protected and preserved as is. There are two protection options available. Provisions must be made to avoid direct impacts to the site during the planned activities (for example, remove the entire unit or a sufficient amount of the unit to avoid impacts to the site). Having a buffer left around each one of the sites would protect the Management Class 2 sites. The size of the buffer would vary based on site-specific circumstances dealing with yarding methods and site vulnerability. With the buffering, each site would be protected.

All site forms were updated with a current description of the condition of the resources, new GPS points, pictures, update sketch maps, and aerial mapping of some sites with multiple components. Flagging tape was placed around the sites to create a buffer. This buffer varied in size depending on the surrounding features associated with the site. Scattered shafts, adits, prospect pits and isolated features and artifacts were noted.

Cumulative Effects

During the survey, cultural resources were mapped, recorded and flagging tape placed around the perimeter of these resources creating a “buffer zone” so that all features within that zone should be avoided. These efforts should result in No Adverse Effects to historic properties. See Appendix C, Design Elements, for actions to take if unrecorded properties are encountered during project implementation.

Economics

Introduction

Due to the fluctuations of the value of timber, price of fuel, salaries, and other expenses, this analysis is based on current rates as of June 2011. The following is excerpted from the financial analysis report located in the project analysis file (Kaney 2011).

Job numbers were not separated for the 2007 State economic report, though sawmills were responsible for about half of all manufacturing receipts and sales (Economic Census 2007). The Forest Service has historically been a source of timber for area mills. The logs coming from federal lands is a percentage of total volume supplied to local mills for a variety of land ownerships and management. Currently all mills are below capacity due to the availability of logs from all sources and global economic conditions. Employment and additional income through contracts is expected to occur over a period of years and pull from workers in both Stevens and surrounding counties.

Data Collection

There were two logging systems analyzed for this project: mechanized (which consisted of 10% tractor and 90% Cut-To-Length systems) and skyline. Generally, tractor-suitable ground would be less than 35% slope; skyline suitability would be where roads and terrain allow skyline

cables to span up to 1,000 feet. Road costs include construction, reconstruction, maintenance which can be found in the Transportation analysis for the East Wedge Project. In addition, costs for reforestation include site preparation, slash disposal, burning, exams and surveys. The essential sale area improvement projects include planning, planting and survey costs.

Region Six LOGCOST100 (logging costs), TEA.ECON (benefit/cost ratio), PQA (product quality adjustment) programs were used for this analysis, and are included in the analysis file.

Regional zone averages from TEA reports and PQA were incorporated with the TEA.ECON program to determine values of products. Values were based on Eastside Douglas-fir. The volume per acre to be harvested is based on 4.9 thousand board feet per acre of sawlogs and an additional 5% for non-sawlogs (fiber).

Direct and Indirect Effects

Non-Timber Projects

The non-timber projects are the “non-commercial” projects that are associated with the East Wedge project.

The proposed action if fully implemented would generate approximately 42 million board feet (MBF) of timber to local mills. Alternative C, if fully implemented would generate approximately 38 MBF of timber to local mills. In today’s market if all portions of the project are implemented, the project would not generate revenue in excess of costs. The degree of deficit is variable due to fluctuations in the lumber market, gas prices and other costs. The alternatives are summarized in Table 28 below:

Table 28. Economic Cost vs. Benefit of the Proposed Action and Alternatives

	No Action	Proposed Action	Alternative C
Predicted High Bid	0	\$18.23	\$18.22
Benefit – Cost Ratio	0	0.34	0.34
Total Discounted NPV*/MBF	0	-\$79.08	-\$83.84
Total Discounted NPV/ac	0	-\$156	-\$150

*NPV = net present value

Returns to the treasury from receipts for selling timber are 25% of the value contracted. The remaining receipts can be distributed to the Roads and Trails Fund (10 percent), the Salvage Sale Fund, KV-SAI (Knutsen-Vandenberg Sale Area Improvements), or Retained Receipts under stewardship contracts. Typically, the distribution in order of priority is mandatory returns to treasury, salvage sale fund, mitigated sale area improvements, and remaining sale area improvements. Retained receipts under stewardship contracts generally take the place of sale area improvement funds. Brush disposal and road maintenance are included as a cost to the project for all commercial units.

Economic Summary

Table 29 shows the approximate value of timber the project would remove, the logging cost to remove that volume, road construction and reconstruction costs, reforestation, and fuels treatments.

Table 29. Economic Analysis of the Proposed Action and Alternative C

	Proposed Action		Alternative C	
	Quantity	(Cost)/Value	Quantity	(Cost)/Value
Timber Product Value	42,377 MBF	\$785,246	38,041 MBF	\$693,107
Harvest Cost	8,116 ac.	(\$3,303,287)	7,377 ac.	(\$3,010,565)
Essential Reforestation	1259 ac.	(\$774,652)	1169 ac	(\$683,500)
Roads				
Reconstruction	61.8 mile	(\$601,932)	61 mile	(\$594,140)
System Road Construction	5.9 mile	(\$306,735)	0	0
Temporary Road Construction	3.7 mile	(\$36,038)	3.7 mile	(\$36,038)
Road Closure	7.8 mile	(\$78,000)	7.8 mile	(\$78,000)
Fuels				
Commercial Units (BD)	7626 ac.	(\$993,120)	6894 ac.	(\$893,480)
Non-Commercial	4067 ac.	(\$691,390)	3908 ac.	(\$664,360)

Table 30 shows the approximate costs of noncommercial treatments proposed for both the proposed action and Alternative C.

Table 30. Cost of Noncommercial Treatments for Both Alternatives
Cost

Project Type	Unit of Measure	Proposed Action		Alternative C	
		No.	Cost	No.	Cost
Pre-Commercial Thinning (PCT)	acres	2,759	\$510,415	2,759	\$510,415
Rx_Burn No Harvest areas	acres	4,067	\$691,390	3,908	\$664,360
Rx_Underburn Harvest Units	acres	5,944	\$891,600	5,398	\$809,700
Rx_Pile Burn after Harvest	acres	1,269	\$82,485	1,073	\$64,745
Rx_Burn Landing Piles	acres	423	\$19,035	423	\$19,035
PCT after Harvest on HSH_TSI or HSH_OSR treatments	acres	132	\$24,200	132	\$24,200
Fence or Barrier Construction – cattle	miles	2	\$10,000	2	\$10,000
Road Closures	miles	7.8	\$78,000	7.8	\$78,000
Treatment compacted displaced soils	Acres	20	\$14,000	18	\$12,600
Totals			\$2,321,125		\$2,193,055

Unless the sale is bid much higher than the Predicted High Bid, treatment of fuels on the noncommercial units, road closures, fence construction, precommercial thinning, and treatment

of compacted and displaced soils would need to be accomplished with appropriated dollars or retained receipts from other stewardship projects.

A project of this nature is typically funded by the receipts from timber harvest which pay for work throughout the planning area. Under today's (2011) economic situation, parts of each action plan such as precommercial thinning or treatment of previously displaced/compacted soils could occur with other funding sources. This and similar limitations occur regardless of the type of sale the project falls under, Timber Sale or Stewardship. Because economic conditions (for example gas prices and lumber value) fluctuate, the Responsible Official chose to analyze the project in its entirety rather than to eliminate parts based on current prices and values. By retaining the project analysis as a whole, it allows the Forest to accomplish as much of the purpose and need as possible under a range of economic situations and unforeseen funding sources.

Although this project is projected at below cost, costs and timber values may change between the time of analysis and the actual implementation. However, continuing to provide opportunities for work and timber to the local mills would help to maintain the economic engine that drives Stevens County.

Cumulative Effects

Since no other projects or activities overlap in time or space related to economics, there are no cumulative effects.

Special Uses

Introduction

Per 36 CFR 251.50(a), "All uses of National Forest System lands, improvements, and resources, except those provide for in the regulations governing the disposal of timber (part 223) and minerals (part 228) and the grazing of livestock (part 222), are designated as "Special Uses." A special-use authorization is a legal document such as a permit, lease, or easement, which allows occupancy, use, rights, or privileges on NFS lands.

Data Collection

The Colville National Forest Special Uses database and the Bureau of Land Management Legacy database were queried in June, 2008 by Kim DiRienz, Forest Special Uses Coordinator. The database was reviewed again in 2013 to determine if there were any changes to authorizations or pending requests.

A review of the Bureau of Land Management (BLM) Legacy 2000 database was conducted on August 9, 2011, and again in June 2013.

Direct and Indirect Effects

There are seven (7) special use authorizations located within the East Wedge planning area: One irrigation waterline, one service building, one communications site and four road

easements. Two more special use authorizations are pending, both for communications facilities.

The BLM database review identified numerous active mining claims within the project area. Claims were listed in T40N, R37E, and T39N, R39E, Willamette Meridian. There is currently an approved Plan of Operation for four claims, but it is unknown which route would be used to transport the material from the claims.

There are no adverse impacts (direct, indirect, or cumulative) anticipated with regard to improvements authorized under special use permits, leases, or easements if the recommended mitigation measures are implemented. Effectiveness of the measures in avoiding impacts to improvements is expected to be very high and success (ability to implement the measure) would also be very high.

Cumulative Effects

Special-use permits pertaining to roads, power lines, telephone lines, and cellular and repeater locations are likely to continue with no change into the future. Short-term special uses for specific events are analyzed on a case by case basis. Because there are no direct or indirect effects to Special Uses, there would be no cumulative effects.

Public Health and Safety

Introduction

There are a substantial number of health and safety hazards to Forest Service employees and private contractors involved with carrying out the proposed action. There are no hazards identified that are unusual or unique to the East Wedge project. The health and safety hazards to Forest Service employees and contractors are addressed by the USDA Forest Service Health and Safety Code (Forest Service Handbook 6709.11), and by Occupational Health and Safety Administration (OSHA) requirements. Analyses of these health and safety hazards are not repeated here. The following information is a summary of the Public Health and Safety report (Shields, 2011) located in the project file.

Existing Conditions, Direct and Indirect Effects

Smoke

The Federal Clean Air Act, revised in 1991, defines National Ambient Air Quality Standards (NAAQS) as levels of pollutants above which detrimental effects on human health and welfare could occur. An area that is found to be in violation of NAAQS is called a “non-attainment area”. Pollution sources in these areas are subject to tighter restrictions. Since the city of Spokane is the nearest non-attainment area, and smoke from prescribed burning in the East Wedge planning area would not affect the Spokane area, NAAQS would not be addressed in this Environmental Assessment.

The Clean Air Act also contains a provision called the Prevention of Significant Deterioration (PSD). The nearest Class I Air Sheds are the Pasayten Wilderness in the Okanogan National

Forest (about 130 miles west) and the Salmo-Priest Wilderness (about 50 miles east) in the CNF. Visibility Protection Guidelines for Washington's Class I areas place restrictions on prescribed burning during weekends from July 1 through Labor Day. Specific prescribed burning restrictions during this time period are based on a distance of less than 60 miles from the Class I area, which would include the Salmo-Priest Wilderness for this project. Since no prescribed burns would take place during the restricted time periods however, PSD would not be analyzed for this Environmental Assessment.

The Washington State Department of Natural Resources (DNR) manages air quality of the state by regulating the quantity and timing of burning throughout the year. Prescribed fire planned by the FS must be approved by the DNR Smoke Management before ignition. The DNR takes into account atmospheric circulation patterns to determine trajectory of smoke emissions and how quickly smoke dissipates to harmless levels. When regional haze and/or particulate counts accumulate to predetermined limits, additional smoke emissions are prohibited.

Managing smoke from prescribed fire involves timing and cooperating with the weather to minimize the impacts of smoke. The Three Rivers Ranger District's burning program takes place when fuels and weather conditions meet predetermined prescription parameters. The burning of either logging slash or natural fuels is done primarily in the dry periods of the spring and fall. In any year, the burning program may involve ignitions on an average of 12-20 days in a year. Burn days are chosen when winds would move smoke out of the planning area and dissipate it. Ignition typically ceases by late afternoon so the smoke from burning that lingers overnight generally shows in a "mid-elevation" inversion layer within the valleys. Inversions generally break up mid-morning and the smoke dissipates upward. Smoke settling into the valley bottoms is rarely seen.

Prescribed fire smoke would affect air quality, but by adherence to the standards and guidelines in regards to smoke emissions, as managed by the Department of Natural Resource Smoke Management Program, all State and Federal requirements are expected to be met.

Dust

Seasonal rain showers and overnight humidity recovery during the summer usually alleviate airborne dust hazards where commercial use is not occurring. Commercial use during historically dry months creates enough airborne dust to reduce visibility and create a possible health hazard in the immediate vicinity of the road. The amount of dust is dependent on moisture and type of road surface. Roads that are surfaced with crushed rock or gravel create less of a dust problem while native surfaced roads on ashy material create the most.

In most cases, dust is not considered a serious health and safety hazard. However, in severe instances (which are occasionally associated with log hauling), visibility can be severely reduced, and breathing, especially in certain individuals, can be adversely affected. Hazards to the public are reduced by limiting access during commercial haul if conditions warrant. Timber sale and stewardship contracts require dust abatement during hauling if dust generation is a problem. Signs would be posted by the contractor during periods of haul to alert users that logging traffic is to be expected. Dust abatement methods would be employed on FS roads at the

discretion of the Sale Administrator. It is the responsibility of the purchaser to coordinate with the County to address dust from haul on county roads.

Dust associated with crusher activity at rock pit sites is done under permit of the State, and would meet State Air Quality Standards.

Mine Shafts

During field reviews related to this analysis, a number of unidentified abandoned mine shafts were found in the project area and mapped. These shafts would be identified on the ground and on resulting contract maps to avoid accidents. There is always the possibility of other shafts being located during layout and project implementation. These areas would be identified and avoided.

Increased Traffic

Implementation of the either action alternative would increase traffic on roads within, and leading to, the planning area. By a small amount, this added traffic increases the chance of vehicle accidents. Signage would be posted by the contractor during periods of haul to alert users that logging traffic is to be expected. Flaggers would be used on an as needed basis.

OHVs are currently permitted on some Maintenance Level 2 roads within and adjacent to the East Wedge planning area, as designated on the 2013 MVUM. Maintenance Level 2 roads are not designed for mixed traffic so there is already somewhat of a safety risk. Alternative C also changes allowed motorized use of Forest Road 1500 from Open Highway Vehicles to Open to All Vehicles. This would not only provide additional opportunities for OHVs to travel along the same road as highway vehicles but also provide travel off this road to several spur roads and trails which allow OHV use. This increases the potential for accidents for OHV users turning on to Forest Road 1500.

The system roads in the analysis area are maintained and signed in accordance with their maintenance and traffic service levels and are considered adequate for use under normal operating conditions. Any management activity that increases use or considerably alters normal traffic patterns should be mitigated with appropriate warning and precautionary signing. Additional road maintenance may be required to safely accommodate heavier volumes.

Logging Hazards

The general public is routinely advised (with warning signs) to stay out of active logging areas. Where logging occurs along main open roads, the timber sale and stewardship contracts contain provisions to protect the public while passing through the logging area. As a result, the risk to the general public from logging (other than traffic hazards discussed above) is very small. Such hazards include falling trees, debris on roadways, rolling rocks or other material, noise, and encounters with moving logging equipment.

Noise

During crushing operations at rock pits, activities can be noisy. Impacts are expected to be minor and temporary.

Prescribed Burning Hazards

In addition to smoke (discussed previously), the health and safety hazards to members of the public who enter active burn areas include being burned, being hit by falling trees or rolling material, stepping into stump or root holes, or being hit (and/or burned) with flammable materials used to ignite prescribed fires. The general public would be advised (with warning signs) to stay out of active prescription burn areas. During aerial ignitions, no one would be allowed inside the ignition area. Impacts to the general public from prescribed burning operations would be small.

Weed Treatments

Health and safety effects from treating noxious weeds are found in the Invasive Plant Final Environmental Impact Statement, Pacific Northwest Region (2005). Appropriate notice and signage would be used during noxious weed treatments to alert public of the ongoing activity.

Improved Road Safety

Public safety on Forest roads would be improved following timber sales. Light and moderate reconstruction on open forest system roads would enhance public safety by widening curves and increasing sight distances as well as reducing potential for rutting due where drainage concerns are addressed.

Reduced Wildfire Risk

Implementing any of the treatments in full would result in reduced risk of large wildfires that can threaten public health and safety.

Cumulative Effects

Smoke from treatment from the Summit Pierre, combined with the activities of the East Wedge project could result in additional increased smoke emissions. However, because all burning activities must be coordinated with the Washington State DNR and all these activities are being coordinated and occurring on the CNF land, no combined activities would produce smoke to an extent to violate air quality standards or the Clean Air Act.

Dust from the activities in the East Wedge could be exacerbated by hauling of logs from the Summit Pierre project. This is expected to be short-term and minimal because the Summit Pierre harvest activities will be hauled west from that project and both the Summit Pierre and East Wedge timber sale contracts would include dust abatement requirements.

Other Required Analyses

Effects on Consumers, Civil Rights, Minority Groups and Women (Includes Environmental Justice Analysis)

The proposed action would contribute to consumers, but only in a limited capacity. It would provide wood products to one or more area sawmills, thus contributing raw materials that would become available to consumers.

All contracts and employment offered by the FS contain Equal Employment Opportunity requirements. Therefore, no adverse or discriminatory effects to Civil Rights, Minority Groups or Women are expected with regards to access to federal contracts or jobs.

Environmental Justice means that, to the greatest extent practicable and permitted by law, all populations are provided the opportunity to comment before decisions are rendered on, are allowed to share in the benefits of, are not excluded from, and are not affected in a disproportionately high and adverse manner by, government programs and activities affecting human health or the environment. In examining the East Wedge project, there are two potential “populations” that may be affected: Tribes of the Colville Reservation and low-income residents of Stevens County.

Tribal Interests

The Confederated Tribes of the Colville Reservation were included in project scoping and thus were informed and invited to consult on the project and the proposed actions. Stevens County Conservation District entered a government-to-government reimbursable agreement with the Tribes to conduct a comprehensive cultural resources survey of the East Wedge project area to meet the provisions of Section 106 of the National Historic Preservation Act.

Letters inviting consultation were sent to the Spokane Tribe, Kalispell Tribe and the Confederated Tribes of the Colville Reservation on January 8, 2011 and March 3, 2011; they were contacted with the opportunities letter, public meeting notices, and scoping letter as well. The Spokane Tribe of Indians stated that no cultural resources were reported in the area of potential impact and gave their approval for the project to move forward. None of the tribes would be impacted by the proposed action or alternative C.

Low Income Residents of Stevens County

Stevens County (at \$20,531) lags behind the State-wide and National averages for both household and personal per capita income by about a third (U.S. Census Bureau, Stevens County). In April 2011, Stevens County had disproportionately high unemployment at 12.0 percent, compared to the State-wide average of 9.2 percent and a National average of 9.0 percent (WA State Employment Security Department Labor Market and Economic Analysis). In 2009, 16.0 percent of Stevens County families were ranked below poverty level, compared to the State-wide rate of 12.3 percent (U.S. Census Bureau 2011).

Changes in the availability of firewood would likely affect low-income residents more than others because alternate sources of heat are more costly. The East Wedge project could provide short-term firewood-gathering opportunities.

Effects on Farmland, Rangeland and Forestland

The East Wedge planning area contains no farmland. Effects to forestlands and rangelands are discussed in the resource reports and the Fire, Fuels, and Forests, and Range Sections on this chapter. No "prime" rangelands occur in the planning area as defined in Forest Service Handbook 1909.15, section 65.21.

Effects on Wetlands and Floodplain

Executive Orders 11988 and Executive Order 11990 require protection of floodplains and wetlands, respectively. Wetlands occupy very small areas within the planning area; however, they play an important role in moderating peak flows and sustaining base flows, especially during periods of drought. They also provide specialized aquatic habitats for wildlife as well as water for cattle. Through implementation of Design Elements (Appendix C) and BMPs (Appendix E), they would be protected under the action alternatives. See the Hydrology and Riparian Areas and Fisheries sections of this report.)

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

The proposal is intended to restore and maintain sustainability and long-term productivity. Short-term and long-term effects from the actions alternatives are discussed for the various resource areas in the direct, indirect and cumulative effects sections of this Environmental Assessment.

Unavoidable Adverse Impacts

Soil compaction as a result of logging is unavoidable. Sediment from soil-disturbing activities reaching streams is unavoidable. Many of these unavoidable effects are short-term and substantially mitigated by Design Elements and Best Management Practices. Further discussion is included in the Soil and Hydrology Reports in the project analysis file.

Smoke from burning forest fuels is unavoidable. By burning within prescription parameters documented in project burn plans, potential adverse effects would be substantially reduced. Adverse air quality impacts from prescribed burning would be substantially less than would result from the same forest fuels burning under wildfire conditions. For more discussion about smoke and air quality effects, see the Public Health and Safety section in this chapter.

Snags and downed logs would be unavoidably lost as a result of timber harvest and prescribed burning. However, snags and downed logs would be created by prescribed burning and subsequent secondary tree mortality.

Some extent of noise and evidence of harvest or fire is an unavoidable effect of this project. However, the Forest Plan identifies specific visual and recreational objectives across the Forest. These values would be maintained in the proposed project.

Irreversible and Irretrievable Commitments of Resources

Irreversible commitment of resources refers to a loss of future options. This term applies primarily to the effects of use on nonrenewable resources or to those factors which are only renewable over long periods of time. The use of rock pits would constitute an irreversible commitment of those resources. The level of loss would be dependent on the amount of rock needed for the road work proposed. The proposed action would result in a higher level of loss because of the system road construction. No system road construction is proposed with Alternative C so the rock would only be used for temporary road construction and reconstruction activities.

Construction of temporary roads and landings would also be considered an irreversible commitment of soil resources. These resources would be restored to natural conditions after long periods of time. While these roads and landings may be considered in future entries, there is no plan at this time to reenter these areas in the future.

Irretrievable commitment of resources refers to a loss of production, harvest or use of natural resources. The proposed action would commit approximately two (2) acres that are currently in timber production into system roads. These acres would remain in system road status for the foreseeable future. Alternative C would have no irretrievable commitment of resources.

Conflicts with Objectives of Other Land Management Plans, Policies, and Controls

There are no known conflicts with the objectives of other land management plans, policies, or controls.

Unique Characteristics of the Geographic Area

The East Wedge planning area contains no unique characteristics or features. There are no park lands, prime farmlands, wild and scenic rivers, ecologically critical areas, congressionally designated areas (such as wilderness, wilderness study areas, inventoried roadless areas, or National Recreation Areas), potential wilderness, Research Natural Areas, or municipal watersheds. The area does contain threatened or endangered species or their habitat, designated critical habitat, floodplains and wetlands, and cultural sites; however, the effects to these resources have been examined herein, and there is nothing noted about these features that would suggest that they are unique, or that associated effects would be significant.

The Degree to which the Effects are Highly Uncertain or Involve Unique or Unknown Risks

There were no highly uncertain, unique, or unknown risks identified in any of the effects analyses conducted for the East Wedge project.

The Degree to which the Action may Establish a Precedent for Future Actions with Significant Effects

None of the actions proposed in the East Wedge project set precedents. The Forest Service has been conducting timber sales and prescribed burns for years; many of which are similar in scope and nature to those proposed in this project. Recent examples of timber harvest thinning and prescribed underburning similar to the East Wedge project include the Kettle Face Fuels Reduction Project (USDA Forest Service 2011), Summit Pierre Fuel Reduction Project (USDA Forest Service 2009), and South Deep Management Project (USDA Forest Service 2006), which have been in various stages of implementation since 2006.

CHAPTER 4. CONSULTATION AND COORDINATION

PUBLIC INVOLVEMENT EFFORTS

This Chapter describes the contributors to the East Wedge Project.

STEVENS COUNTY CONSERVATION DISTRICT EMPLOYEES

Interdisciplinary Team Members

Project Administrator – Claudia Michalke
Archeologist – Camille Pleasants, Colville Confederated Tribe, Reimbursable Agreement
Botanist – George Wooten
Engineer – Wayne Cornwall, PE
Fisheries/Wildlife Biologist – Sarah Newman
Fuels Specialist – Don Strand
GIS Specialist – Steve Myers
Hydrologist – Bert Wasson
Silviculturist – Lynn Kaney
Soil Scientist – Mark Vander Meer
Writer/Editor – Claudia Michalke

Interdisciplinary Team Support

Botany Assistants
Sharon Clark, Ronald Moore, Jill Nicholson, Cindy Parsons, Jim Peterson
Stand Exam Foresters/Technicians
Phil Anderson, Grover Hedrick, Peter Malinak, Jim Peterson
Soil Technicians
Christine Bisette, Tyler Carlin, Kurt von Kleis, Pedro Marques

COLVILLE NATIONAL FOREST SPECIALISTS SUPPORT

NEPA Coordinator – Bill Shields
Archaeologist – Steve Kramer
Botanist – Kathy Ahlenslager
Fisheries Biologist – Karen Honeycutt
Fuels Specialist – Shane Robson
Hydrologist – Jennifer Hickenbottom
Logging Systems and Economics – Kelvin Davis
Range and Noxious Weeds Specialist – Travis Fletcher
Recreation Specialist – Eric McQuay
Road Engineer – Bruce Bailey
Silviculturist – Tom Pawley
Soil Scientist – Hillary Talbott-Williams
Wildlife Biologist – Chris Loggers

FEDERAL, STATE, AND LOCAL AGENCIES

The following State and Federal agencies were sent letters or received verbal communication inviting comment and/or participation in the East Wedge Project:

- United States International Boundary Commission
- United States Department of the Interior, Fish and Wildlife Service
- United States Department of Agriculture Natural Resource Conservation Service
- United States Homeland Security, Border Patrol
- United States Department of the Interior, Bureau of Land Management
- Washington State Department of Natural Resources
- Washington State Department of Ecology
- Washington Department of Fish and Wildlife

Stevens County Conservation District held East Wedge project public meetings on January 20, 2010 and August 17, 2010 and gave a project presentation at their annual meetings in 2010, 2011 and 2012. Representatives from the Washington State Department of Natural Resources (DNR), the USDA Natural Resource Conservation Service, the United States Department of Interior, Bureau of Land Management and the Homeland Security Border Patrol attended one or more of the public meetings. Materials relevant to the state and federal grant programs were offered at the public meetings.

A public scoping meeting was held March 17, 2011. No comments were received during the scoping period from the public agencies listed above.

On September 28, 2011, a letter was sent to the above agencies, Representative Cathy McMorris Rodgers, Senator Maria Cantwell and Senator Patty Murray, notifying them the EA was available for review, the project was entering a 30-day comment period and outlining the comment process. No comments were received.

TRIBAL GOVERNMENTS

Letters inviting consultation were sent to the Confederated Tribes of the Colville Reservation, the Spokane Tribe of Indians, and the Kalispel Tribe of Indians January 8, 2010 and March 3, 2011. These same governments were contacted with the Opportunities letter, public meeting notices, and Scoping letter described in Chapter 1 of this EA. Written notification was received January 27, 2010 from Randy Abrahamson, Tribal Historic Preservation Officer Spokane Tribe of Indians that no cultural resources were reported in the area of potential effect and gave their approval for the project to move forward. On September 27, 2011 a letter and a copy of the EA were sent to all three Tribes inviting them to comment, notifying them that the project was entering a 30-day comment period and outlining the comment process. No comments were received.

COUNTY GOVERNMENT

County Commissioners

Invitation letters were mailed to the Stevens County Commissioners for the January 20, 2010, public meeting; the February 18, 2010 Stevens County Conservation District (SCCD) Annual meeting; the August 17, 2010 public meeting; the February 15, 2011 SCCD Annual meeting; and the March 17, 2011 public scoping meeting. They received project updates in their office on April 5, 2010 and again November 22, 2010. They were represented at several collaboration meetings with the SCCD, FS and NEWFC. They did not comment during the public scoping period. On September 26, 2011, a copy of the EA and cover letter were hand-delivered and discussed with the Commissioners. The Commissioners submitted a very positive written comment. May 1, 2012, Commissioner Don Dashiell met with SCCD staff to discuss project update and to invite a presentation to the full board of Commissioners. May 22, 2012, SCCD staff met with Stevens County Commissioners and presented briefing paper/project update.

STEVENS COUNTY PUBLIC LANDS ADVISORY COMMITTEE

Project presentations were provided to the Stevens County Public Lands Advisory Committee on April 15, 2010 and December 16, 2010 and they received invitation letters to attend and participate in the public meetings held January 20, 2010, August 17, 2010, and March 17, 2011. They did not comment during the public scoping period. On September 28, 2011, a letter and a copy of the EA were sent to the chairman of the SCPLAC inviting them to comment, notifying them that the project was entering a 30-day comment period and outlining the comment process. On October 5, 2011, their members participated in a meeting to discuss the EA and issues for the Responsible Official consideration. SCPLAC did not submit written comments. March 20, 2012, Gary Nielsen met with SCCD staff discussing project update and other issues.

TRI-COUNTY MOTORIZED RECREATION ASSOCIATION

Project presentations were provided to members of the Tri-County Motorized Recreation Association on December 16, 2010 and February 17, 2011 and they received invitation letters to attend and participate in the public meetings held January 20, 2010, August 17,

2010, and March 17, 2011. They provided written comments during the public scoping period. On September 28, 2011, a letter and a copy of the EA were sent to the chairman of the TCMRA inviting them to comment, notifying them that the project was entering a 30-day comment period and outlining the comment process. On October 5, 2011, their members participated in a meeting to discuss the EA and issues for the Responsible Official consideration. They submitted written comments.

STEVENS COUNTY CATTLEMEN'S ASSOCIATION

Project presentations were provided to members of the Stevens County Cattlemen's Association on December 4, 2010 (undocumented), December 16, 2010 and February 17, 2011 and they received invitation letters to attend and participate in the public meetings held January 20, 2010, August 17, 2010, and March 17, 2011. In addition, Forest Service permittees with grazing allotments in the East Wedge project area were invited to all public meetings. Special one-on-one meetings with the permittees were scheduled August 4, 2010. The Stevens County Cattlemen's Association provided written comments during the public scoping period. On September 28, 2011, a letter and a copy of the EA were sent to the chairman of the Stevens County Cattlemen's Association inviting them to comment, notifying them that the project was entering a 30-day comment period and outlining the comment process. On October 5, 2011, their members participated in a meeting to discuss the EA and issues for the Responsible Official consideration. They submitted written comments. March 26, 2012, Scott Nielsen met with SCCD staff discussing project progress and other issues.

STEVENS COUNTY FARM BUREAU

A project presentation was provided to members of the Stevens County Farm Bureau November 9, 2010 and they received invitation letters to attend and participate in the public meetings held January 20, 2010, August 17, 2010, and March 17, 2011. They did not comment during the public scoping period. On September 28, 2011, a letter and a copy of the EA were sent to the chairman of the Stevens County Farm Bureau inviting them to comment, notifying them that the project was entering a 30-day comment period and outlining the comment process. No written comments were received.

OTHER

The East Wedge project was also mentioned, or presentations provided, at several undocumented meetings including the local Society of American Foresters meeting in Colville April 21, 2011; CNF staff; Northeast Washington Association of Conservation Districts Annual meeting October 28, 2010; Washington State Senator Bob Morton and State Representative Shelly Short meeting November 4, 2010; and monthly open public meetings of the SCCD Board of Supervisors. The Stevens County Water Conservancy Board, the Stevens County Noxious Weed Control Board, and the British Columbia Forest Service were included in all mailings referenced above. The Colville Chamber of Commerce included an article on the project in their September 27, 2011 email to members and interested parties.

COLLABORATION

Guidelines developed by the Northeast Washington Forestry Coalition (NEWFC) were used for preliminary project development. NEWFC prescriptive guidelines used during collaboration included their Roads Policy 4, Regeneration Guidance Revised 20100309 v2, Old Growth Restoration Guidelines 78, Mesic Restoration Treatment Agreements, and 20090213 Revised Thinning Guidance -10.

The East Wedge collaboration process consisted of a series of meetings held with IDT members, NEWFC, and the FS August 18, 2010, November 2, 2010, November 17, 2010, December 8, 2010, December 16, 2010, January 6, 2011 and February 17, 2011. The meetings were open to the public. Photos, GIS layers and IDT personal knowledge of the area were also provided. NEWFC was sent the letters of invitation to the public meetings described above. NEWFC members attended the January 20, 2010 and March 17, 2011 public meetings. NEWFC provided written comments during the public scoping period.

On September 28, 2011, a letter and a copy of the EA were hand-delivered to the chairman of the NEWFC inviting them to comment, notifying them that the project was entering a 30-day comment period and outlining the comment process. On October 5, 2011, their members participated in a meeting to discuss the EA and issues for the Responsible Official consideration. They submitted written comments. NEWFC representatives, FS and SCCD staff met February 9, 2012, at the request of the FS, to discuss/resolve several NEWFC issues.

PUBLIC COMMENTS

Several comments were received during the planning process for the East Wedge project. A list of participants and the date on which their input was received is found in Table 31 below.

Table 31. Public Comments Received During the Planning Process

No.	Date	Source
01	2011_03_08	Wade Penny
02	2011_03_09	Phillip D. Hargrove
03	2011_03_17	Bill Kurrle
04	2011_03_21	Gary Fetter
05	2011_03_27	Jim Barrett
06	2011_03_24	TCMRA, M. Blankenship
07	2011_04_01	Conservation Northwest/The Lands Council, Heflick, Juel
08	2011_04_08	Stevens Cty. Cattlemen's Association, S. Nielsen
09	2011_04_09	Northeast Washington Forestry Coalition, Williamson, Heflick
10	2011_10_07	Dick Artley
11	2011_10_19	Stevens Co. Commissioners
12	2011_10_19	Gary Kittilson
13	2011_10_21	NEWFC, Heflick, Williamson, Dunton
14	2011_10_21	Pete Guglielmino
15	2011_10_25	Yvette Goot
16	2011_10_25	Stevens Cty. Cattlemen's Association, Scott Nielsen
17	2011_10_27	Gary Nielsen
18	2011_10_28	Tri-County Motorized Recreation Assoc., Mike Blankenship
19	2011_10_28	Conservation Northwest, David Heflick & The Lands Council, Jeff Juel