ENVIRONMENTAL ASSESSMENT

FOR THE

DEEP BLUE TIMBER SALE

PREPARED BY

David Olsen, Forest Management Supervisor

Plains Unit, Northwestern Land Office

Montana Department of Natural Resources and Conservation

October, 2012

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MEMORANDUM

To: Dave Olsen, Forest Management Supervisor, Plains Unit

From: Larry Ballantyne, Plains Unit Resource Program Manager

Date: January 11, 2012

RE: Deep Creek Timber Sale Objectives

Primary Objective
The primary objective of the Deep Creek Timber Sale is to generate income for the Common School (CS) trust. The land parcels involved in this proposed project are located in Section 16 T23N, R30W. This project would provide an estimated 1.5 MMBF of merchantable timber applied toward meeting the FY 2012 Northwestern Land Office timber sale volume target.

Secondary Objectives
Minimize losses in timber quality and available volume resulting from deteriorating stand conditions in the defined project area as well as surrounding forested land.
Promote the continued presence and/or reestablishment of historically appropriate timber types on Trust land included in this project.
Reduce fire hazard and associated risks of loss to State of Montana and privately owned lands in the area.

Management Directives
In planning and preparing this project, requirements and specified actions as designated in the DNRC HCP shall be addressed, management direction of the State Forest Land Management Plan and associated Administrative Rules shall be followed, and all applicable Streamside Management Zone rules and regulations will be met. Montana Best Management Practices will be applied in all instances.

CHECKLIST ENVIRONMENTAL ASSESSMENT

Project Name:	Deep Blue Timber Sale
Proposed Implementation Date:	December 2012
Proponent:	Department of Natural Resources and Conservation, Northwest Land Office, Plains Unit
Location:	Section 16, Township 23 North, Range 30 West
County:	Sanders

I. TYPE AND PURPOSE OF ACTION

The Department of Natural Resources and Conservation (DNRC) proposes to harvest approximately 12,000 tons (1.5 MMBF) of timber in the Deep Creek area, approximately 12 air miles northwest of Thompson Falls, Montana, in Sanders County. The project would involve ground and cable based harvest systems, mechanical slash piling and pile burning burn over approximately 320 acres. This action would produce estimated revenue of $312,000.00 for the Common Schools (CS) Trust Grant and an estimated $45,000.00 in Forest Improvement Fees. Activities proposed would reduce excessive fuel loading and the related risk of wildfire, reduce the risk of insect infestations, promote timber types historically found in the area, and increase forest productivity beneficial to future trust actions.

The project would require approximately .50 miles of new road construction, obliteration of .60 miles of existing roads, reconditioning, upgrading and maintenance of 2.5 miles of existing road systems as necessary to meet Best Management Practices (BMPs). The DNRC, State of Montana would explore the opportunity to enter into a Cost Share Road Access Agreement with the USDA Lolo National Forest and the Kootenai National Forest. The Agreement would provide the State with legal access on existing roads to the north end of Section 16 (State land); provide the Lolo National Forest access to on USDA (FS) lands West and Northwest of Section 16 and the Kootenai access to USDA (FS) lands to the north of Section 16. If the Cost Share Agreement is implemented before the end of the sale the 68000 extension road may be utilized as part of the haul route. The USDA Forest Service would assume the decision of restrictions on roads involved in the cost share agreement.

Lands involved in this proposed project are held by the State of Montana in trust for the support of specific beneficiary institutions such as the public buildings trust, public schools, state colleges, universities, and other state institutions (Enabling Act of February 22, 1889:1972 Montana Constitution, Article 1 Section11). The Board of Land Commissioners and the Department of Natural Resources and Conservation are required, by law, to administer these trust lands to produce the largest measure of reasonable and legitimate return over the long run for these beneficiary institutions (Section 77-1-202, MCA). DNRC would manage lands involved in this project in accordance with the State Forest Land Management Plan (DNRC 1996), the Administrative Rules for Forest Management (ARM 36.11.401 through 71), and conservation commitments contained in the Montana Forested State Trust Lands Habitat Conservation Plan (HCP) as well as other applicable state and federal laws.

II. PROJECT DEVELOPMENT

1. PUBLIC INVOLVEMENT, AGENCIES, GROUPS OR INDIVIDUALS CONTACTED:

Provide a brief chronology of the scoping and ongoing involvement for this project. List number of individuals contacted, number of responses received, and newspapers in which notices were placed and for how long. Briefly summarize issues received from the public.

Public involvement has been solicited through local newspaper advertisements (Valley Press, Sanders County Ledger and The Missoulian) plus letters sent to adjacent landowners and other known interested parties and organizations. Responses have been received via mail, email and by phone:

- one email inquiring about cultural resources
- one email concerning thermal cover for elk
- one phone call from an adjacent landowner to offer access and his property as a landing area if we are planning on logging in the southeast corner of the section (there are no plans to enter that stand at this time)
- one phone call concerning logging activities around his easement for a spring development and would we require him to move his trespassing fence line
- two letters from adjacent landowners concerning access roads and weed management were received
- hydrological, soils, wildlife and vegetative concerns were identified by DNRC specialists and field foresters for the Action Alternative as well as the effects of the No Action Alternative

Issues and concerns have been resolved or mitigated through project design or would be included as specific contractual requirements of the project. Recommendations to minimize direct, indirect and cumulative impacts have been incorporated in the project design (see Attachment 1, Area Maps and Project Plan; Attachment II, Resource Analysis; Attachment III, Prescriptions; Attachment IV, Mitigation; Attachment V, Consultants and References).

2. OTHER GOVERNMENTAL AGENCIES WITH JURISDICTION, LIST OF PERMITS NEEDED:

Examples: cost-share agreement with U.S. Forest Service, 124 Permit, 3A Authorization, Air Quality Major Open Burning Permit.

Incidental Take Permit – U.S. Fish and Wildlife Service

In December 2011, the U.S. Fish and Wildlife Service issued DNRC an Incidental Take Permit under Section 10 of the Endangered Species Act. The Permit applies to select forest management activities affecting the habitat of grizzly bear, Canada lynx, and three fish species — bull trout, westslope cutthroat trout, and Columbia redband trout — on project area lands covered under the HCP. DNRC and the USFWS will coordinate monitoring of certain aspects of the conservation commitments to ensure program compliance with the HCP.

Montana Department of Environmental Quality (DEQ)

DNRC is classified as a major open burner by the Montana Department of Environmental Quality (DEQ), and is issued a permit from the DEQ to conduct burning activities on State lands managed by the DNRC. As a major open burning permit holder, DNRC agrees to comply with all of the limitations and conditions of the permit.

Montana/Idaho Airshed Group

DNRC is a member of the Montana/Idaho Airshed Group, which regulates prescribed burning, including both slash and broadcast burning, related to forest management activities done by DNRC. As a member of the Airshed Group, DNRC agrees to burn only on days approved for good smoke dispersion as determined by the Smoke Management Unit in Missoula, MT.

A Temporary Road Use Permit would be acquired from the US Forest Service, if necessary. The DNRC would seek the opportunity to enter into a Cost Share Road Agreement with the USDA Forest Service to acquire permanent access on new and existing roads utilized as the haul route for the proposed timber sale.

3. ALTERNATIVE DEVELOPMENT:
Describe alternatives considered and, if applicable, provide brief description of how the alternatives were developed. List alternatives that were considered but eliminated from further analysis and why.

Action: The Action Alternative is shown in Section 1, Type and Purpose of Action. Recommended actions to reduce environmental effects would be incorporated into the proposed action.

No Action: Under the No Action Alternative, no activity would be undertaken. No timber would be harvested, no road improvements and no Road Cost Share Agreement would occur. The No Action alternative would result in decreased growth rates, continued decline of stand conditions and increased fuel loading within the timber stands. This alternative would not produce revenue for the Common Schools (CS) Trust Grant. The State would not gain legal access on the existing road system within the section. Effects of the No Action Alternative are show in the Checklist and Attachments and can be used to compare effects of the proposed action.

III. IMPACTS ON THE PHYSICAL ENVIRONMENT

- *RESOURCES potentially impacted are listed on the form, followed by common issues that would be considered.*
- *Explain POTENTIAL IMPACTS AND MITIGATIONS following each resource heading.*
- *Enter "NONE" If no impacts are identified or the resource is not present.*

4. GEOLOGY AND SOIL QUALITY, STABILITY AND MOISTURE:
Consider the presence of fragile, compactable or unstable soils. Identify unusual geologic features. Specify any special reclamation considerations. Identify direct, indirect, and cumulative effects to soils.

Recommendations from a DNRC hydrologist to minimize direct, indirect, and cumulative impacts have been incorporated in the project design. (Attachment I, Area Maps and Project Plan: Attachment II, Resource Analysis: Attachment III, Prescriptions: Attachment IV, Mitigation). As detailed in the Soils Analysis, limiting the area of adverse effects would control cumulative effects.

5. WATER QUALITY, QUANTITY AND DISTRIBUTION:
Identify important surface or groundwater resources. Consider the potential for violation of ambient water quality standards, drinking water maximum contaminant levels, or degradation of water quality. Identify direct, indirect, and cumulative effects to water resources.

A DNRC hydrologist has reviewed the project area, transportation system and harvest plan. Recommendations to minimize impacts have been incorporated into the project design. No road building or logging activities will take place in the SMZ. (See Attachment II, Resource Analysis, Hydrology Analysis/Soils Analysis; Attachment IV, Mitigation Measures). Cumulative effects to sediment delivery and water yield would be limited through BMP implementation.

6. AIR QUALITY:
What pollutants or particulate would be produced (i.e. particulate matter from road use or harvesting, slash pile burning, prescribed burning, etc)? Identify the Airshed and Impact Zone (if any) according to the Montana/Idaho Airshed Group. Identify direct, indirect, and cumulative effects to air quality.

The project is located in Montana State Airshed 2. Some particulate matter would be introduced into the Airshed from the burning of logging slash. Impacts are expected to be minor and temporary with slash burning to be conducted when conditions favor good to excellent smoke dispersion. All burning would be conducted during times of adequate ventilation within the existing rules and regulations.

7. VEGETATION COVER, QUANTITY AND QUALITY:

What changes would the action cause to vegetative communities? Consider rare plants or cover types that would be affected. Identify direct, indirect, and cumulative effects to vegetation.

Under the Action Alternative, timber harvest would occur on approximately 320 acres and would maintain the existing even-aged, mixed conifer structure of the stand. The Action Alternative would do little to move the stands toward Desired Future Condition of ponderosa pine or western larch due to the emphasis on Douglas fir retention to maintain a 60% canopy cover to provide for thermal cover for big game. Also fall or winter harvest operations would limit the amount of scarification produced during logging activities; however the overall health of the stand would improve due to removal of unhealthy trees that are susceptible to insect and disease which would increase the productivity of the stands. The decrease in tree mortality would cause a decreased in fuel loading which would lessen the chance of a stand replacement fire, insect infestation and reduce the advance of root disease. For a more detailed stand level description see Attachment III “Prescriptions” pg. 62.

No old growth stands as defined by Green (1992) are present in the project area; therefore the action alternative would not affect old growth. No sensitive plants listed by the Montana Natural Heritage Program have been identified in the project area. Measures to minimize noxious weeds, insects and disease are included in the project design. (see Attachment IV, Mitigation).

Recommendations to minimize direct, indirect and cumulative impacts have been incorporated in the project design (see Attachment 1, Area Maps and Project plan: Attachment II, Resource Analysis, Attachment III, Prescriptions; Attachment IV, Mitigation.

8. TERRESTRIAL, AVIAN AND AQUATIC LIFE AND HABITATS:

Consider substantial habitat values and use of the area by wildlife, birds or fish. Identify direct, indirect, and cumulative effects to fish and wildlife.

There is eagle nest that is active this fall and would be expected to be so throughout the timber harvest project on at least a seasonal level. A DNRC wildlife biologist has reviewed the project area, transportation system and harvest plan. Recommendations to minimize impacts have been incorporated into the project design. (See Attachment II, Resource Analysis, Wildlife Analysis, Bald Eagles, pg. 43 and Water Resource Analysis for the effects to species that may occur as a result of the proposed action. See Attachment IV, Mitigations for a complete list of mitigations).

9. UNIQUE, ENDANGERED, FRAGILE OR LIMITED ENVIRONMENTAL RESOURCES:

Consider any federally listed threatened or endangered species or habitat identified in the project area. Determine effects to wetlands. Consider Sensitive Species or Species of special concern. Identify direct, indirect, and cumulative effects to these species and their habitat.

The analysis identified suitable habitat for the following species in the project area and vicinity: the grizzly bear, bald eagle, gray wolf, the flammulated owl, pileated woodpecker, the fisher and big game habitat. The grizzly bear, listing status is considered endangered as specified under the Endangered Species Act. The bald eagle, flammulated owl, grey wolf, pileated woodpecker, the fisher and big game habitat are listed by the DNRC as sensitive. Recommendations to minimize direct, indirect and cumulative impacts have been incorporated into project design. (See Attachment II, Resource Analysis; Wildlife Analysis for effects to species that may occur as a result of the proposed action. See Attachment IV, Mitigations for a complete list of mitigations).

10. HISTORICAL AND ARCHAEOLOGICAL SITES:
Identify and determine direct, indirect, and cumulative effects to historical, archaeological or paleontological resources.

No significant sites or artifacts have been identified by a DNRC archeologist.

11. AESTHETICS:
Determine if the project is located on a prominent topographic feature, or may be visible from populated or scenic areas. What level of noise, light or visual change would be produced? Identify direct, indirect, and cumulative effects to aesthetics.

The timber stands adjacent to the Blue Slide Road are fairly open due to residential and public road easements, power line easements, gravel stockpiling, legal and illegal firewood gathering and past harvesting operations. The selective harvest prescriptions along with regeneration retention along the Blue Slide Road and other main roads should minimize further visual impacts. The changes in tree cover density would be slight and may be noticeable, however existing regeneration retention/protection and selective harvesting should reduce visual impacts. Visual impacts would be temporary as tree canopies grow together. (See Attachment IV, Mitigation).

12. DEMANDS ON ENVIRONMENTAL RESOURCES OF LAND, WATER, AIR OR ENERGY:
Determine the amount of limited resources the project would require. Identify other activities nearby that the project would affect. Identify direct, indirect, and cumulative effects to environmental resources.

No impacts are likely to occur under either alternative.

13. OTHER ENVIRONMENTAL DOCUMENTS PERTINENT TO THE AREA:
List other studies, plans or projects on this tract. Determine cumulative impacts likely to occur as a result of current private, state or federal actions in the analysis area, and from future proposed state actions in the analysis area that are under MEPA review (scoped) or permitting review by any state agency.

Deep Creek Timber Sale Environmental Analysis, 1985
Earl's 612, Cat EX 2008
Deep Six 612, Cat EX, 2011
USDA Spring Creek Timber Sale EIS, 2011

IV. IMPACTS ON THE HUMAN POPULATION

- *RESOURCES potentially impacted are listed on the form, followed by common issues that would be considered.*
- *Explain POTENTIAL IMPACTS AND MITIGATIONS following each resource heading.*
- *Enter "NONE" If no impacts are identified or the resource is not present.*

14. HUMAN HEALTH AND SAFETY:
Identify any health and safety risks posed by the project.

Human health would not be impacted by the proposed timber sale or associated activity. There are no unusual safety considerations associated with the proposed timber sale.

15. INDUSTRIAL, COMMERCIAL AND AGRICULTURE ACTIVITIES AND PRODUCTION:
Identify how the project would add to or alter these activities.

Timber harvest would provide continuing industrial production in the Plains area.

16. QUANTITY AND DISTRIBUTION OF EMPLOYMENT:

Estimate the number of jobs the project would create, move or eliminate. Identify direct, indirect, and cumulative effects to the employment market.

According to Montana Bureau of Business and Economic Research about 10 jobs are supported for one year for every 1 MMBF that is harvested. For this project, that equates to about 15 jobs for one year.

17. LOCAL AND STATE TAX BASE AND TAX REVENUES:

Estimate tax revenue the project would create or eliminate. Identify direct, indirect, and cumulative effects to taxes and revenue.

People are currently paying taxes from the wood products industry in the region. Due to the relatively small size of the timber sale, there would be no measurable cumulative impact from this proposed action on tax revenues.

18. DEMAND FOR GOVERNMENT SERVICES:

Estimate increases in traffic and changes to traffic patterns. What changes would be needed to fire protection, police, schools, etc.? Identify direct, indirect, and cumulative effects of this and other projects on government services

Log trucks hauling to the purchasing mill would result in temporary increases in traffic on the Blue Slide Road. This increase is a normal contributor to the activities of the local community and industrial base and cannot be considered a new or increased source.

19. LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS:

List State, County, City, USFS, BLM, Tribal, and other zoning or management plans, and identify how they would affect this project.

In 1996, the Land Board approved the Record of Decision (ROD) for the State Forest Land Management Plan (SFLMP). The SFLMP provides philosophical basis, consistent policy, technical rationale, and guidance for the management of forested state trust lands. In 2003, DNRC adopted the Administrative Rules for Forest Management (Forest Management Rules; ARM 36.11.401 through 456). The Forest Management Rules are the specific legal resource management standards and measures under which DNRC implements the SFLMP and subsequently its forest management program.

In December 2011, the Land Board approved the Record of Decision (ROD) for the Montana Forested State Trust Lands Habitat Conservation Plan (HCP). Approval of the ROD was followed by the issuance of an Incidental Take Permit (Permit) by the U.S. Fish and Wildlife Service (USFWS). The HCP is a required component of an application for a Permit which may be issued by the U.S. Fish and Wildlife Service or National Marine Fisheries Service to state agencies or private citizens in situations where otherwise lawful activities might result in the incidental take of federally-listed species. The HCP is the plan under which DNRC intends to conduct forest management activities on select forested state trust lands while implementing specific mitigation requirements for managing the habitats of grizzly bear, Canada lynx, and three fish species: bull trout, westslope cutthroat trout, and Columbia redband trout.

20. ACCESS TO AND QUALITY OF RECREATIONAL AND WILDERNESS ACTIVITIES:

Identify any wilderness or recreational areas nearby or access routes through this tract. Determine the effects of the project on recreational potential within the tract. Identify direct, indirect, and cumulative effects to recreational and wilderness activities.

The area is hunted frequently. Roads through the area that would be closed after the project only access the immediate area, closure of them would not affect the ability of people to recreate on these parcels. Recreational areas and wilderness are not accessed through this tract. Illegal off road vehicle use is expected to decrease while legal use is expected to remain the same with the Action Alternative.

21. DENSITY AND DISTRIBUTION OF POPULATION AND HOUSING:
Estimate population changes and additional housing the project would require. Identify direct, indirect, and cumulative effects to population and housing.

There would be no measurable direct, indirect or cumulative impacts related to population and housing due to the relatively small size of the timber sale, and the fact that people are already employed in this occupation in the region.

22. SOCIAL STRUCTURES AND MORES:
Identify potential disruption of native or traditional lifestyles or communities.

No impacts related to social structures and mores would be expected under either alternative.

23. CULTURAL UNIQUENESS AND DIVERSITY:
How would the action affect any unique quality of the area?

No impacts related to cultural uniqueness and diversity would be expected under either alternative.

24. OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES:
Estimate the return to the trust. Include appropriate economic analysis. Identify potential future uses for the analysis area other than existing management. Identify direct, indirect, and cumulative economic and social effects likely to occur as a result of the proposed action.

Costs, revenues and estimates of return are estimates intended for relative comparison of alternatives. They are not intended to be used as absolute estimates of return. The estimated stumpage is based on comparable sales analysis. This method compares recent sales to find a market value for stumpage. These sales have similar species, quality, average diameter, product mix, terrain, date of sale, distance from mills, road building and logging systems, terms of sale, or anything that could affect a buyer's willingness to pay for. The effect of the proposed project would generate an estimated return to the school trust of $312,000.00 and $45,000.00 in Forest Improvement Fees in the Alternative Action. The No Action alternative does not generate income to the school trust at this time.

EA Checklist Prepared By:	Name: David Olsen	Date: 10/12/2012
	Title: Forest Management Supervisor	

V. FINDING

The Action Alternative meets the project objectives and is selected for implementation. The No Action Alternative fails to meet the stated objectives concerning this project.

26. SIGNIFICANCE OF POTENTIAL IMPACTS:

No significant impacts have been identified to occur as a result of implementation of the Action Alternative.

27. NEED FOR FURTHER ENVIRONMENTAL ANALYSIS:

[ ] EIS	[ ] More Detailed EA	[X] No Further Analysis

EA Checklist Approved By:	Name: Larry Ballantyne	
	Title: Plains Unit Manager	
Signature: Larry Ballantyne		Date: 10-25-12

ATTACHMENT I

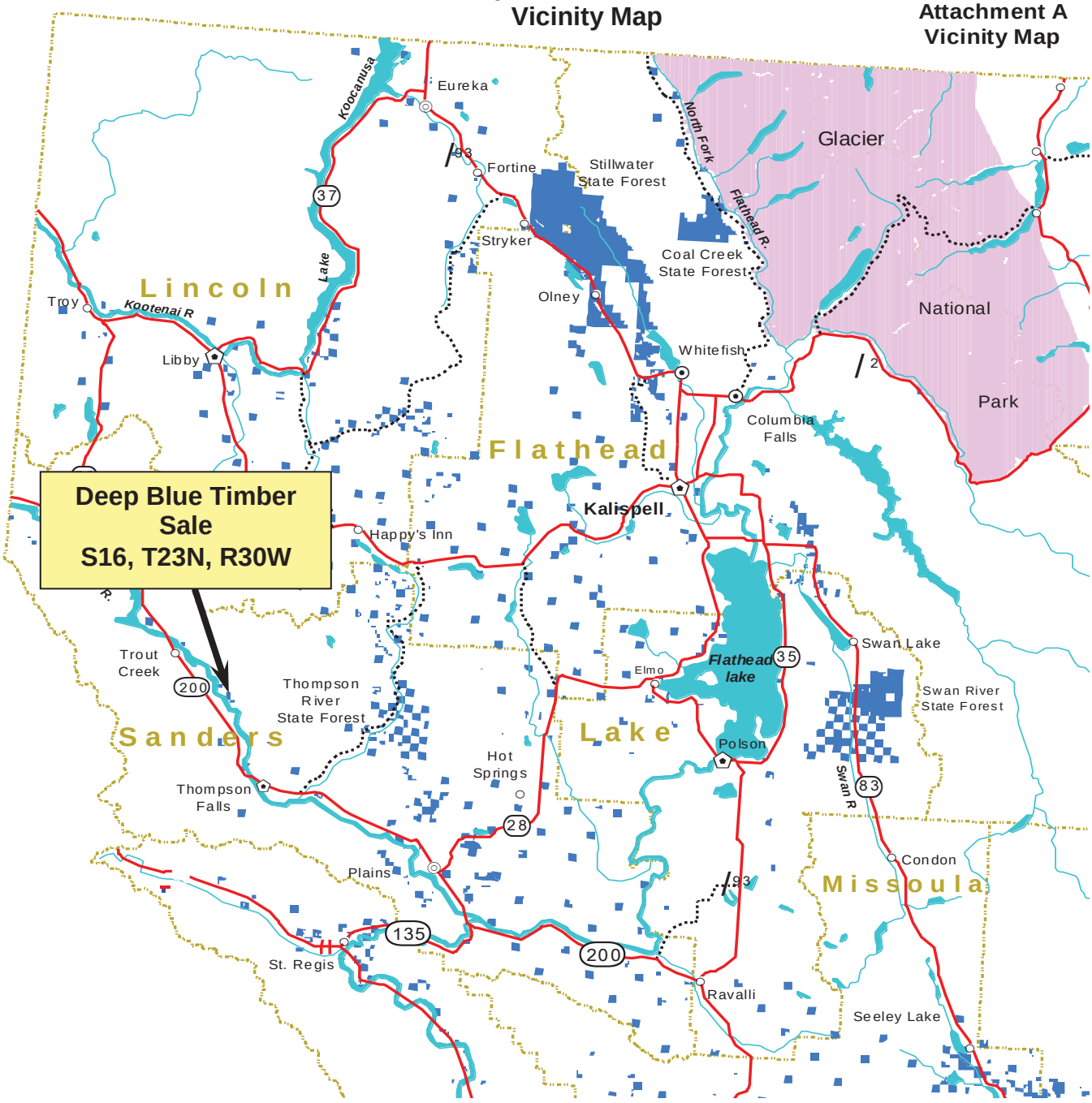
Sale & Access Maps

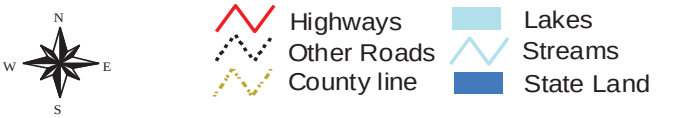
Harvest Units and Travel Plan

Cover Types

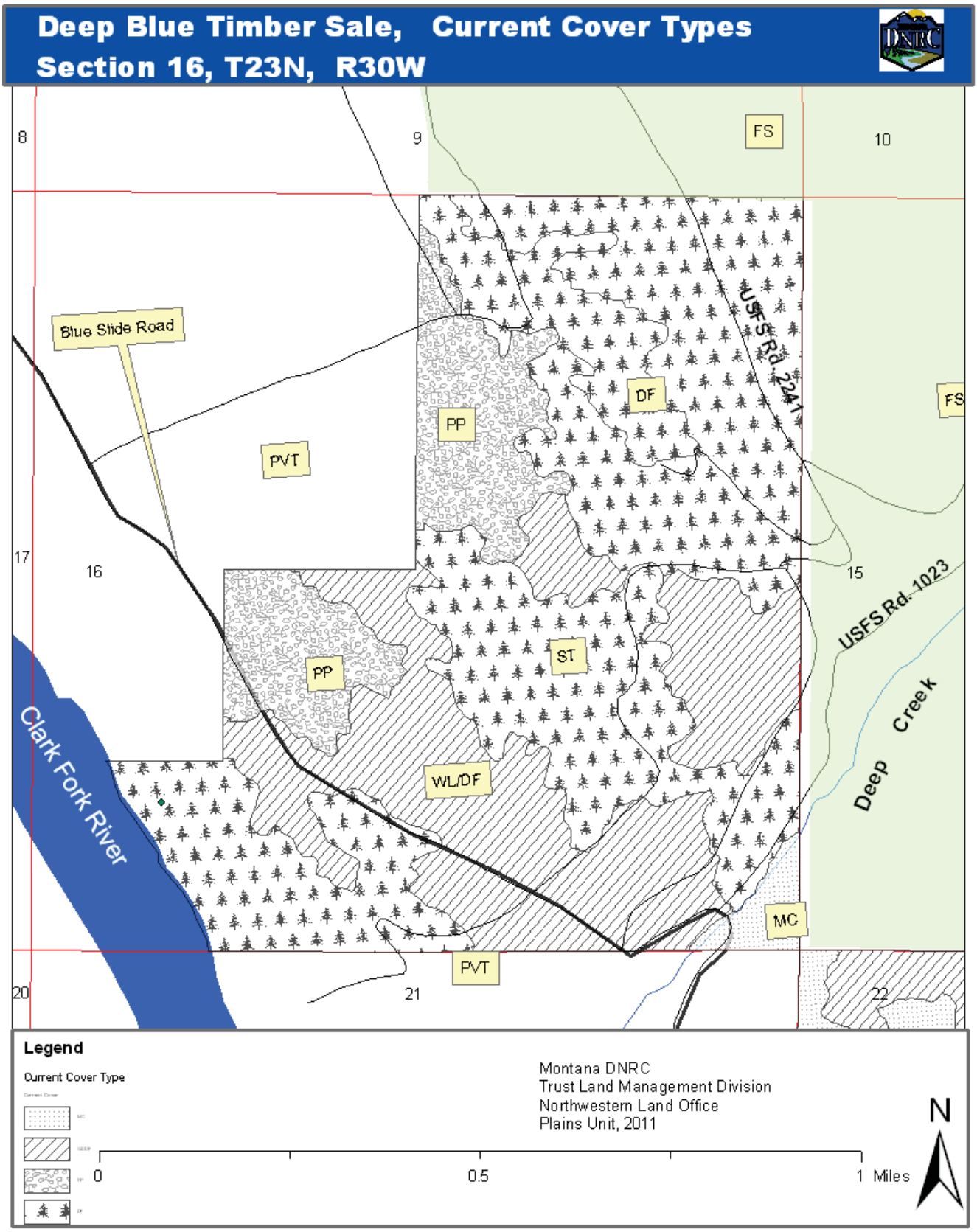
Deep Blue Timber Sale
Vicinity Map

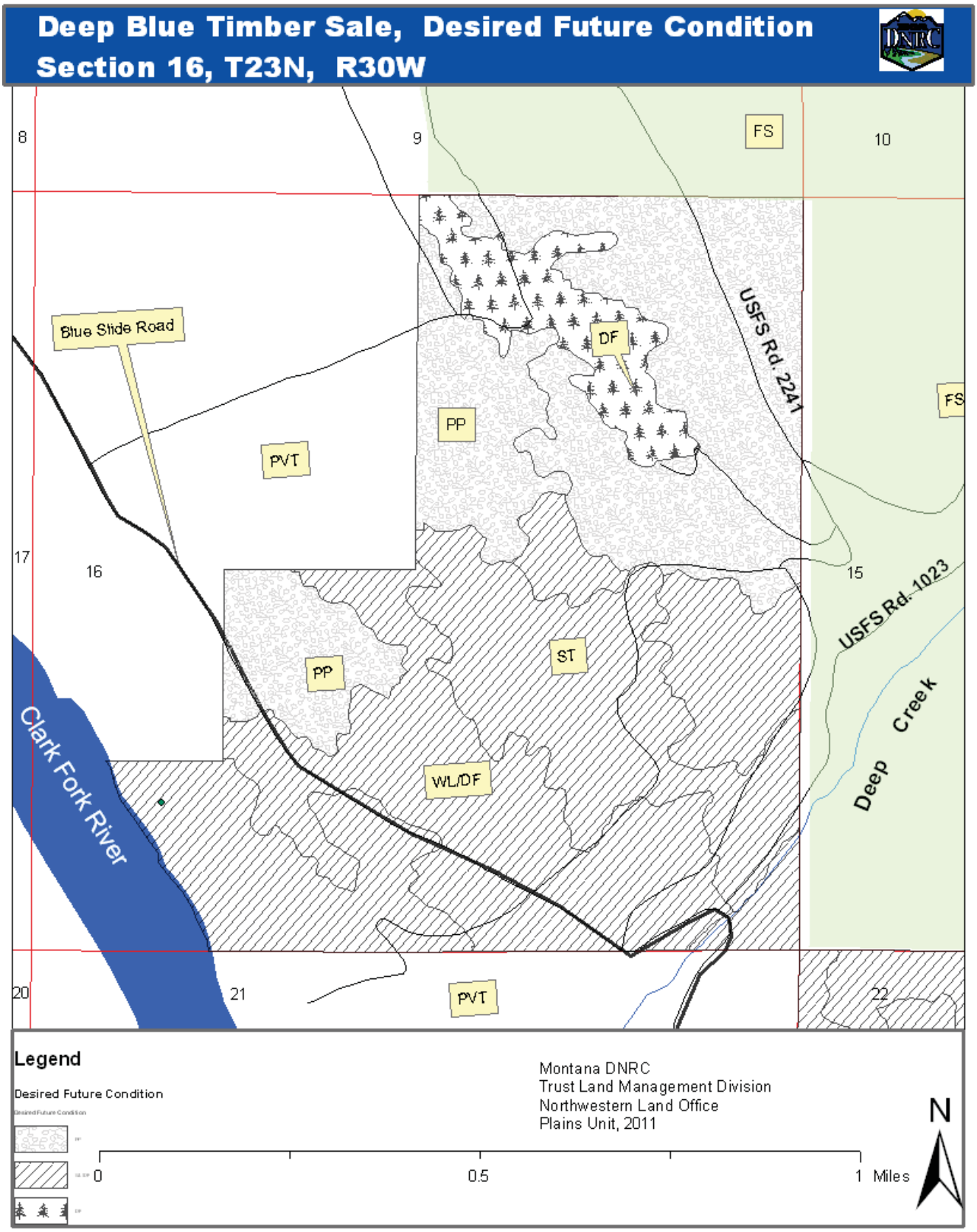
Attachment A
Vicinity Map



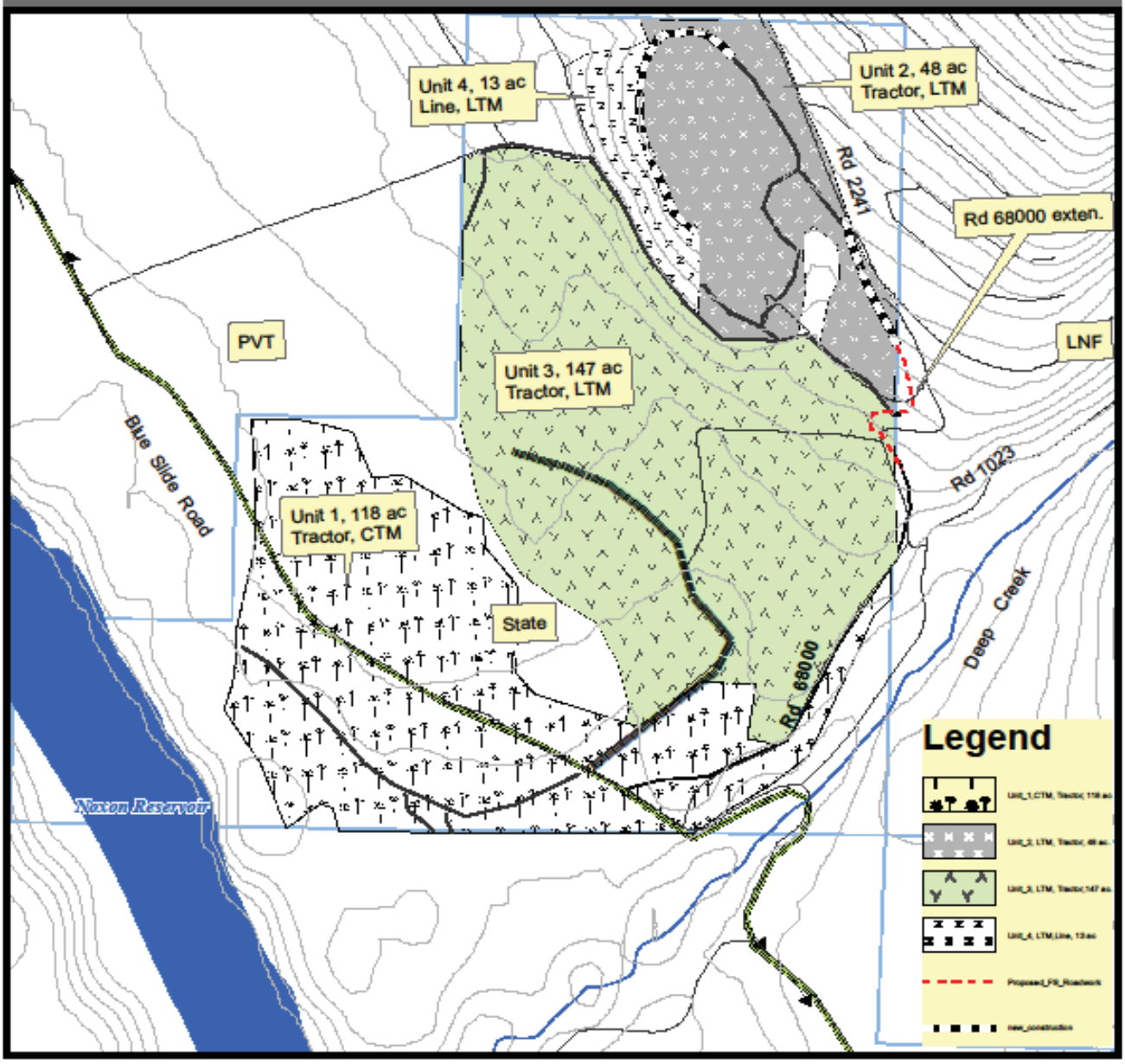


Highways
Other Roads
County line
Lakes
Streams
State Land


Deep Blue Timber Sale, Current Cover Types
Section 16, T23N, R30W
8
9
10
FS
Blue Slide Road
USFS Rd. 2241
DF
PP
PVT
FS
17
16
15
USFS Rd. 1023
ST
PP
Clark Fork River
Deep Creek
WL/DF
MC
PVT
20
21
22
Legend
Current Cover Type
Montana DNRC
Trust Land Management Division
Northwestern Land Office
Plains Unit, 2011
0
0.5
1 Miles
N


Deep Blue Timber Sale, Desired Future Condition
Section 16, T23N, R30W
8
9
10
FS
Blue Slide Road
DF
USFS Rd. 2241
FS
PP
PVT
17
16
15
USFS Rd. 1023
ST
PP
Clark Fork River
Deep Creek
WL/DF
20
21
PVT
22
Legend
Desired Future Condition
Montana DNRC
Trust Land Management Division
Northwestern Land Office
Plains Unit, 2011
0
0.5
1 Miles
N

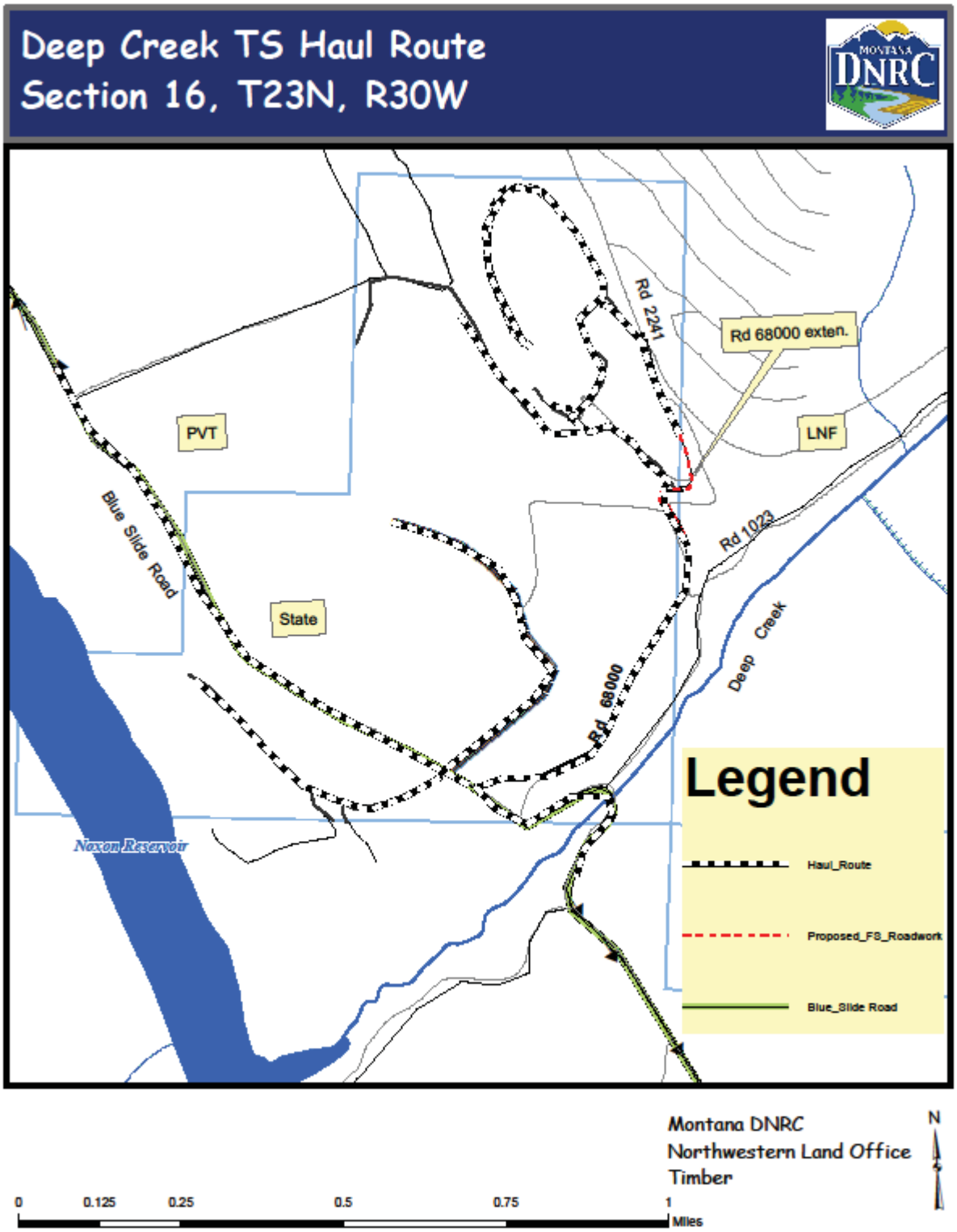
Deep Creek TS Harvest Map
Section 16, T23N, R30W



Montana DNRC
Northwestern Land Office
Timber

N

0 0.125 0.25 0.5 0.75 1 Miles


Deep Creek TS Haul Route
Section 16, T23N, R30W
MONTANA DNRC
Rd 2241
Rd 68000 exten.
PVT
LNF
Blue Slide Road
Rd 1023
State
Deep Creek
Rd 68000
Noxon Reservoir
Legend
Haul_Route
Proposed_FS_Roadwork
Blue_Slide Road
Montana DNRC
Northwestern Land Office
Timber
N
0
0.125
0.25
0.5
0.75
1
Miles

Attachment II

Resource Analysis

Page #

Vegetation Analysis **19**

Soils Analysis **22**

Water Resources Analysis **29**

Wildlife Analysis **34**

Vegetation Analysis

Introduction

This analysis is designed to disclose the existing condition of the vegetative resource and display the anticipated effects that would result from each alternative of this proposal. During the initial scoping, issues were developed by the public and internally regarding vegetative concerns. The following concerns were expressed from these comments regarding proposed timber harvesting and related activities:

- Concern regarding impacts to threatened, endangered and sensitive plant and animal species (TES) and big game animal species.
- Fire Ecology: There is concern that the exclusion of fire from the site has changed stand compositions, and age classes from what would have historically occurred in the area. There is also concern that forest fuels have accumulated to a point that would leave this area predisposed to a catastrophic fire event.
- Forest Health: There are concerns that endemic populations of diseases and insects are increasing on the site and have the potential to reach epidemic proportions or reduce productivity.

General Description of Area

The proposed Deep Blue Timber Sale is located approximately 12 miles NW of Thompson Falls, Montana. Located in Section 16, Township 23N, Range 30W, the parcel is referred to as the Deep Creek and includes 480 acres of State Trust Land. Adjacent ownerships are either small private or Forest Service.

Analysis Method and Area.

The Plains Unit typically prepares two to four timber sales per year. Each project is evaluated for its potential effects on lands managed by the DNRC and the surrounding landscape. Methods used in the analysis included review of stand level inventory (SLI) data, field visits, review of scientific literature, aerial photography, and consultation with other professionals. The analysis area for direct and indirect effects to vegetation is S16, T23N, R30W in Deep Creek parcel. Cumulative impacts are considered at the scale of the Plains Unit.

Existing Condition and Management History

Section records indicate this parcel of State land was first logged in the mid 1950's. The first major sale occurred in the early 1960's, at which time approximately one million board feet was removed. Two large sales occurred in the mid 1980's; one involved approximately one million board feet of salvage and another harvest of two and one-half million board feet occurred. Since that time, there have been numerous small salvage and timber permits sold. This section does not have a grazing license or permit issued for it. The sale area is accessed by a secondary State highway, the Blue Slide Road. This road crosses the sale area and receives a good deal of residential and commercial traffic. The sale area is well roaded from previous sales; most are Kelly humped, obliterated or inaccessible. A few of these roads may be reopened but would be closed by gate or earthen berm following harvest activities. Open roads provide access to the south end of the section and to private residences south of the Blue Slide Road and also to the north end of the section.

Past and current events have changed the forest conditions on the proposed area from what would have been present historically according to Losensky's "Historical Vegetation of Montana" (1997).
The area was historically characterized by frequent, low-intensity wildfires prior to the early 1900's. The proposed sale area is in part of the 1910 burn, which created a dense stand of mixed timber species that evolved to an essentially even aged, single story stand with a few scattered, over mature trees, that

survived the 1910 fire. The majority of the timber on the site is now 90-95 years old. Scattered throughout the area are some individual over mature relics, mostly Douglas fir, but also a few ponderosa pine and western larch. These few trees are in excess of 200 years old and compared to the rest of the stand they are quite large. The older trees average less than one per acre over the 320 acre sale area that survived the 1910 fire.

Past harvest operations has created a relatively open canopy over the majority of the southern half of the section. Trees have begun regenerating in scattered pockets and appear to be a relatively healthy stand of mixed conifer species; these pockets of regeneration would be retained and protected during the proposed harvest activities. The northern half of the section, which was not treated by harvest operations, is a relatively closed canopy, even –aged stand. Essentially no regeneration is occurring under the dense canopy although occasionally where the canopy does open; grand fir and Douglas fir are both reproducing successfully. The selective tree harvest, with a goal of retaining 60% canopy cover to address thermal cover for big game, will do little to move these stands to the Desired Future Condition . Silvicultural prescriptions, therefore, have been developed to maintain a healthy mixed conifer, even-aged management stand. Current Cover Types and Desired Future Conditions stand maps can be seen in Attachment 1, Maps.

All stands within the project area are beginning to show increases in fuel loading due to advancing shade tolerant regeneration (Douglas-fir, Grand fir,) which acts as a green ladder fuel. This type of fuel loading is developing in parts of all stands within the project area. Insect and disease mortality in all stand components is also contributing to dead fuel loading. There is visual evidence of logging trails, corridors and landings from past management actions on State land, however the parcel is surrounded by private ownership which has been previously harvested and views of past logging are common in the area.

The primary insect and disease agents in the stands are infestations of Dwarf mistletoe (*Arceuthobium douglasii & Arceuthobium laricis*), Fir Engraver beetle (*Scolytus ventralis*), Douglas-fir beetle (*Dendroctunus pseudotsugae*) and root rot (*Armillaria mellea*). The overstory, intermediate components and the overstocked understory are all being affected at a moderate level now, but increasing due to competition from overstocking and advanced age.

Noxious weeds, mainly knapweed, are present throughout the project area, mostly prevalent along open roads and within stand openings.

Direct and Indirect Effects on Activities on Vegetation

No Action Alternative

No timber harvest or associated activities would occur under this alternative. Timber types would continue to advance towards climax conditions with shade tolerant Douglas- fir and grand fir continuing to thrive in the understory. These species would becoming dominant and would replace the ponderosa pine and western larch. Growth and vigor of the trees present in the analysis area would continue to decline as competition for resources increases. Insect and disease would continue on a path from endemic to epidemic as infestation/infection progresses. Noxious weeds would continue to exist along the roads and move into the forested areas as natural disturbances provide available seedbeds.

Action Alternative

The proposed alternative would harvest timber on approximately 320 acres. The harvest would be focused on the removal of poorly formed and multiple topped, along with those affected by or susceptible to insect and disease mortality. The proposed harvest would maintain existing cover types, even-aged status and continue even-aged management. Overall composition and quality of the stand should improve as competition for resources is reduced, undesirable, diseased and poorly formed trees area removed. Existing second growth regeneration would be expected to increase vigor and growth as competition from the overstory is reduced. Harvest and site preparation activities would increase crown spacing and decrease canopy cover from 90-95% to 60-65% in the intermediate and overstory components. Growth and vigor would increase because residual tree spacing would allow increased light to crowns and reduce competition for water. More detailed information for treatment by individual units can be obtained in Attachment
III,"Prescriptions".

Due to past logging and development activities within the Deep Creek parcel, site distance from the county road is currently approximately 200-300 feet and would not be expected to change until regeneration advances. The selective harvest prescription and the inclusion of a buffer strip along the main roads should minimize the visual impacts (see Attachment III, Prescriptions).The end result will still be denser and contain larger trees than does most of the surrounding ownership. The visual impacts would be minimized by using road screening, skid trail and corridor design with the appropriate logging systems.

Noxious weeds may increase in canopy openings and will be monitored and addressed through an integrated pest management plan including chemical and biological control methods. Roads and skid trail approaches would be seeded and spot treated with chemicals following construction and project completion. Prior to entering site, off-road logging equipment would be cleaned and inspected through the timber sale contact to avoid seed migration. Roads would be closed following the sale to avoid migration of weed seed into the area. Post harvest, the area would be included in the Plains Unit's integrated weed management program. Biological, mechanical and chemical methods would be used to control noxious weeds.

Cumulative Effects

No Action Alternative

Under this alternative, stand structure and species composition on State land across the Plains Unit are expected to continue the change towards more shade tolerant species. The No Action Approach would gradually move these stands away from the desired future condition of seral cover types and decreased stocking levels. Fuel loading would be expected to increase and stands would become more susceptible to a stand replacement fire, as well as increased mortality from insects and disease.

Action Alternative

Across the Plains Unit, there would be no change toward desired potential vegetation class. (See Table II, Cover types). Due to road construction, approximately 2 acres would be removed from timber production.

SOILS ANALYSIS

INTRODUCTION

This analysis is designed to disclose the existing condition of the soil resources and display the anticipated effects that may result from each alternative of this proposal. During the initial scoping, issues were identified by the internally and from the public regarding soil impacts. The following issue statements were expressed from comments regarding the effects of the proposed timber harvesting:

**Ground based harvest techniques can displace and compact soils which can adversely affect the hydrologic function, structure and long-term productivity of the impacted area*

**Reduced infiltration capacity of an impacted soil can result in overland flow and off-site erosion, typically localized to main skid trails and log landing sites.*

**Removal of both coarse and fine woody material off-site during timber harvest operations can reduce nutrient pools required for future forest stands and can affect the long-term productivity of the site.*

ANALYSIS AREA

The project area for this proposal is approximately 420 acres. The project area contains five individual landtypes types. The analysis area for soil impacts will be the area within harvest units and where proposed road activities would take place. This analysis area will adequately allow for disclosure of existing conditions and direct, indirect, and cumulative impacts. This analysis also looks at cumulative effects for the entire project area.

ANALYSIS METHODS

Methods for disclosing impacts include using general soil descriptions and the management limitations for soil. This analysis will qualitatively assess the risk of negative effects to soils from erosion, compaction, and displacement from each alternative, using insight from previously collected soils-monitoring data from over 90 DNRC postharvest monitoring projects.

Coarse woody debris will be evaluated by comparing pre-project conditions with recommended levels. Mitigation measures will be refined using these data.

While the anticipated impacts from each alternative will disclose the direct/indirect effects, the cumulative impacts will be the result of previous and proposed activities.

EXISTING CONDITIONS

GENERAL CONDITIONS

The Plains Unit is dominated by partially metamorphic, sedimentary rocks from the 600-million year old Belt Supergroup. The PreCambrian rocks in this area are generally comprised of argillites, quartzites and siltites. (Collins and Ottersberg, 1985). These general rock types tend to be stable with a low erosion potential. Overlying these sediments is a layer of loess influenced volcanic ash deposited and redeposited from Mount Mazama approximately 6700 years ago. The presence of volcanic ash or lacustrine silts may increase the erosion potential depending upon slope, vegetation and surface rock.

The *Soil Survey of Sanders and Parts of Lincoln and Flathead Counties, Montana Parts I and II* (*NRCS, 1996*) and *Lolo National Forest Land System Inventory* (Sasich; Lamotte-Hagen 1989) provides soil information and maps of soils in the project area. *TABLE ST-1 - PROJECT AREA LANDTYPE DESCRIPTIONS* provides a brief description of the soils within the project area while FIGURE SF1: PROJECT AREA LANDTYPE MAP provides a visual reference. Additional maps of the soils are in the project file and resource limitations can be accessed on the internet via the Natural Resources Conservation Service's Web Soil Survey at http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx .

COURSE WOODY DEBRIS

Course woody debris was measured during field review on several transects in the parcel. All woody debris was measured along eight transects, each 100 feet in length, using methodology from the *Handbook for Inventorying Downed Woody Material* (Brown 1974). Over all transects the average coarse woody debris was estimated at 3 tons per acre with a range of 0 to 8.6 tons per acre.

Recommended levels for similar habitat types in Montana and Idaho is in the range of 4.5 to 14 tons per acre.

CUMULATIVE EFFECTS

DNRC strives to maintain soil productivity by limiting cumulative soil impacts to 15 percent or less of a harvest area, as noted in the State Forest Land Management Plan (*DNRC, 1996*). As a recommended goal, if existing detrimental soil effects exceed 15 percent of an area, proposed harvesting should minimize any additional impacts. Harvest proposals on areas with existing soil impacts in excess of 20 percent should avoid any additional impacts and include restoration treatments, as feasible, based on site-specific evaluation and plans. Past monitoring on DNRC timber sales from 1988 to 2010 has shown an average of 11.3 percent soil impacts across all parent materials. Stratifying the results by soil texture that are similar to the majority of the proposed harvesting shows an average of approximately 13.5 percent of the harvest areas impacted from erosion, displacement or severe compaction (*DNRC 2011*).

The DNRC soil monitoring report (DNRC 2005) noted that ground-based operations that used dozers for site preparation and piling had the largest areas of compaction. Of the 17 sites with similar soils (silt loam and gravelly-silt loam), 8 were dozer piled and had an average 20.2 percent moderate or higher impact from erosion, displacement or severe compaction. The 8 sites with similar soil but were not scarified or piled with a dozer showed moderate or higher impacts from erosion, displacement or severe compaction of 7.5 percent. This practice has substantially been changed as a result of the monitoring.

Cumulative effects from past and current uses on the proposed harvest units are limited, although evidence of selective or salvage actions is present in some of the proposed harvest areas. Recent timber sale and salvage activity has occurred in the section within areas of the proposed units. In addition, a timber harvest permit was awarded for the northeast corner of the project area.

During field reconnaissance, it was noted that impacts in these areas are limited to skid trails and roads. Existing skid trail densities were estimated in the field and using geographic information systems. The area covered by existing skid trails is estimated to be less than 10% of the project area. Additionally, the existing skid trails were generally vegetated with grasses and forbs.

Other uses in the project include small forest product removals such as firewood gathering, fence post cutting, and Christmas tree harvesting.

TABLE ST1: PROJECT AREA LANDTYPE DESCRIPTIONS

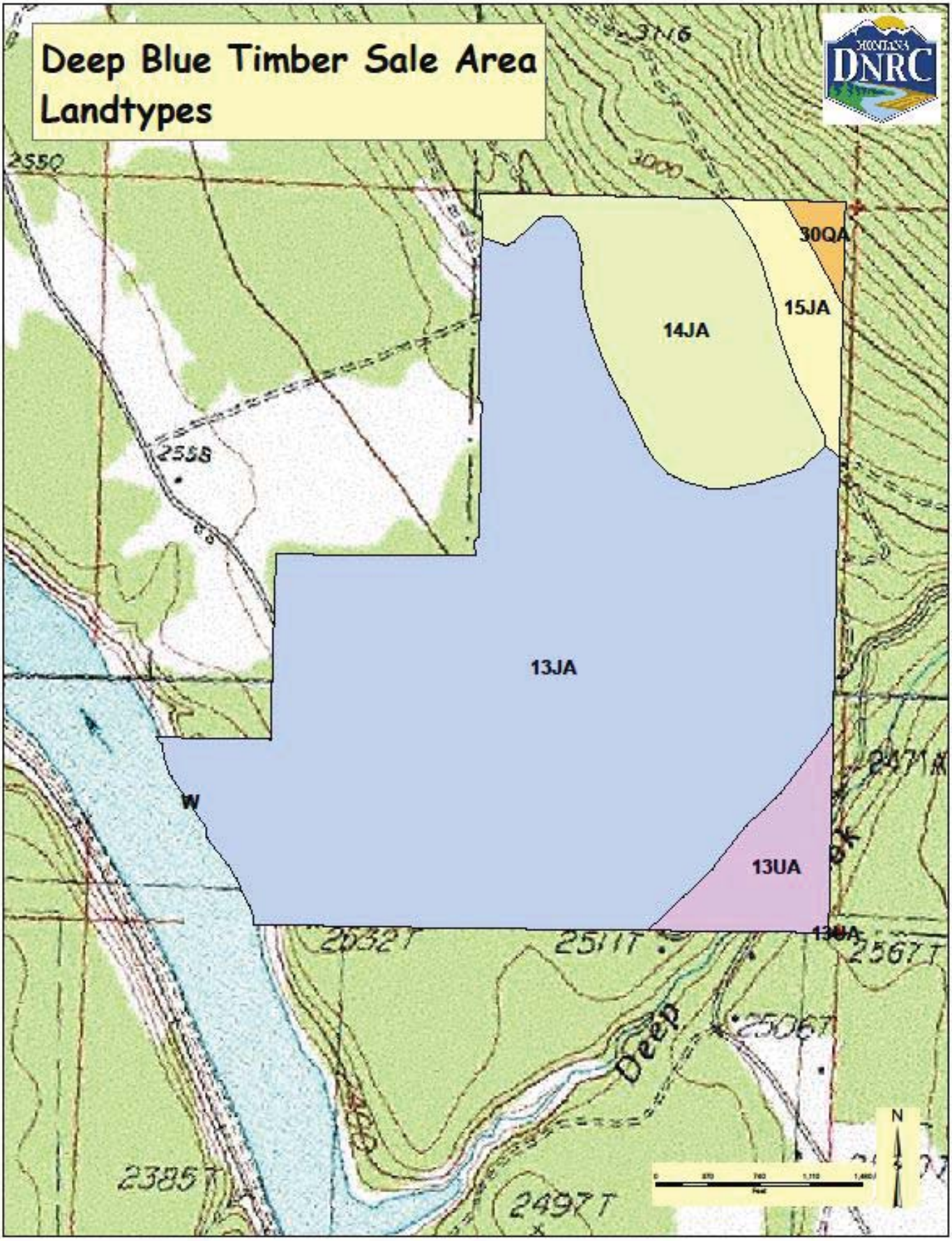
Soil Type	Name	Soil & Vegetation Descriptions	Management Considerations			
			K factor**/erosion potential*	Timber	Roads	Comments
13JA	High stream terraces. Up to 35% slopes	Soils of this landtype have been formed in lake deposits and overly very cobbly alluvial deposits. Vegetation is dry forest of Douglas-fir, ponderosa pine and western larch over an understory of shrubs and forbs. Wetter sites may include grand fir, and lodgepole pine.	K=0.15 to 0.37 Erosion potential is considered low to moderate	Potential Prod: Moderate/high Equipment: Tractor Regen: Can be limited by frost pockets and competition from grasses.	Roads perform well with standard location, construction and maintenance practices. Some cutslopes may be difficult to revegetate due to moisture stress. Roads located on silty soils may be dusty when dry.	Some steep slopes may limit tractor operation
13UA	High stream terraces. Up to 45% slopes	Soils of this landtype have been formed in gravelly or cobbly alluvial deposits. Vegetation is dry forest of Douglas-fir, ponderosa pine and western larch over an understory of shrubs and forbs.	K=0.15 to 0.37 Erosion potential is considered low to moderate	Potential Prod: High Equipment: Tractor Regen: Can be limited by frost pockets and competition from grasses	Roads perform well with standard location, construction and maintenance practices. Some cutslopes may be difficult to revegetate due to moisture stress. Roads may be rough due to abundant cobble.	Some steep slopes may limit tractor operation. .
14JA	Foothills and benches. 5 to 30% slopes	Soils are formed in deep, silty lake deposits. Vegetation is a dry forest of ponderosa pine and Douglas-fir over shrubs, forbs and grasses.	K=0.0.17 to 0.24 Erosion potential is considered low to moderate	Potential Prod: Moderate Equipment: Tractor Regen: Can be limited by moisture stress, frost heaving and competition from grasses	Roads in silty soils are prone to rutting when wet due to low bearing strength; these roads may also be dusty when dry. Cutslopes area erosive; slough easily and therefore difficult to revegetate.	Soils may rut when wet.
15JA	Footslopes, benches and alluvial fans 5 to 35% slopes	Soils are quite variable in this landtype although generally stony to very stony surface soils are found. Vegetation is a mixed conifer forest over a variety of shrubs, forbs and grasses. Some riparian areas in this landtype are not forested.	K=0.24 Erosion potential is considered moderate	Potential Prod: Moderate Equipment: Tractor Regen: Can be limited by wet soil, frost pockets and competition	Roads in silty soils are prone to rutting when wet due to low bearing strength; these roads may also be dusty when dry.	Soils may rut when wet

30QA	Moderate relief mountain slopes 35 to 55% slopes	Soils are somewhat excessively well-drained and coarse with a surface layer of gravelly silt loam. Vegetation is open grown dry forest of ponderosa pine over a grassy understory. Scattered shrubs may be present In some areas.	K=0.24 Erosion potential is considered moderate	Potential Prod: low Equipment: cable with some tractor Regen: moisture limits reforestation	Roads perform well with standard location, construction and maintenance practices. Roads may also be dusty when dry.	

** Erosion Potential is based on slope and soil erosion factor K**. The soil loss is caused by sheet or rill erosion in off-road or off-trail areas where 50 to 70 percent of the surface has been exposed by logging, grazing, mining, or other kinds of disturbance. The hazard is described as slight (low), moderate, severe, or very severe. A rating of slight indicates that erosion is unlikely under ordinary climatic conditions; moderate indicates that some erosion is likely and that erosion-control measures may be needed; severe indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and very severe indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion–control measures are costly and generally impractical. (NRCS, 1996)*

***Erosion Factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water. (NRCS, 1996)*

FIGURE SF 1: PROJECT AREA LANDTYPE MAP


Deep Blue Timber Sale Area
Landtypes
30QA
15JA
14JA
13JA
13UA
13UA
Deep
N

ENVIRONMENTAL EFFECTS

DESCRIPTION OF ALTERNATIVES

- *No-Action Alternative*

  No timber harvesting or associated activities would occur under this alternative.

- *Action Alternative*

- Three units totaling approximately 320 acres would be managed with commercial harvest under this alternative. The harvest may be completed under summer or winter conditions. In addition the following road work would occur:

  - approximately 0.5 miles of road construction
  - 2.3 miles would be maintained or have minor drainage improvements installed as necessary
  - 0.6 miles of existing road would be used and obliterated.

ALTERNATIVE EFFECTS ON SOILS

- *Direct and Indirect Effects of the No-Action Alternative on Soils*

  No timber harvesting or associated activities would occur under this alternative. Skid trails from past harvesting would continue to recover from compaction as freeze-thaw cycles continue and vegetation root mass increases.

- *Direct and Indirect Effects of the Action Alternative on Soils*

  To provide an adequate analysis of potential impacts to soils, a brief description of implementation requirements is necessary. *ARM 36.11.422 (2)* and *(2)(a)* state that appropriate BMPs shall be determined during project design and incorporated into implementation. To ensure that the incorporated BMPs are implemented, the specific requirements would be incorporated into the DNRC Timber Sale Contract. As part of this alternative design, the following BMPs are considered appropriate and, therefore, would be implemented during harvesting operations:

  1) Limit equipment operations to periods when soils are relatively dry, (less than 20 percent), frozen, or snow-covered to minimize soil compaction and rutting and maintain drainage features. Check soil moisture conditions prior to equipment start-up.

  2) On ground-based units, the logger and sale administrator will agree to a general skidding plan prior to equipment operations. Skid-trail planning would identify which main trails to use and how many additional trails are needed. Trails that do not comply with BMPs (i.e. trails in draw bottoms) would not be used and may be closed with additional drainage installed where needed or grass seeded to stabilize the site and control erosion.

  3) Tractor skidding should be limited to slopes of less than 40 percent unless the operation can be completed without causing excessive erosion. Steeper areas may require other methods such as adverse skidding to a ridge or winchline skidding from more moderate slopes of less than 40 percent.

  4) Keep skid trails to 20 percent or less of the harvest unit acreage. Provide for drainage in skid trails and roads concurrently with operations.

  5) Slash disposal - Limit the combination of disturbance and scarification to 30 to 40 percent of the harvest units. No dozer piling on slopes over 35 percent; no excavator piling on slopes over 40 percent unless the operation can be completed without causing excessive erosion. Consider lopping and scattering or jackpot burning on the steeper slopes. Accept disturbance incurred during skidding operations to provide adequate scarification for regeneration.

  6) Retain 10 to 15 tons of large woody debris and a majority of all fine litter feasible following harvesting operations. On units where whole tree harvesting is used, implement one of the following mitigations for nutrient cycling: 1) use in-woods processing equipment that leaves slash on site; 2) for whole-tree harvesting, return-skid slash and evenly distribute within the harvest area; or 3) cut tops from every third bundle of logs so that tops are dispersed as skidding progresses.

Considering data from the *DNRC SOIL MONITORING REPORT (DNRC, 2005)*, the implementation of Forestry BMPs has resulted in less risk of detrimental soil impacts from erosion, displacement, and severe compaction. While the report noted that the impacts were more likely on the fine-textured soils and steep slopes, reduced soil productivity due to compaction and displacement may occur on coarser parent materials similar to those found in the state parcels. Also, the greatest impacts were noted where harvesting implementation departed from BMPs, such as limiting ground-based skidding to slopes of 40 percent or less or operating only on dry, frozen or snow-cover soils.

Comparing the soil type map, field reconnaissance notes, and topographic map features with the proposed harvest unit map indicates that ground-based skidding would occur on slopes of up to 40 percent under this alternative. The extent of impacts expected would likely be similar to those reported by *Collins (DNRC, 2005)*, or approximately 13.5 percent (43 acres) of the harvest area for summer harvesting.

- *Cumulative Effects of the Action Alternative to Soils*

  Cumulative effects would be controlled by limiting the area of adverse soil impacts to less than 15 percent of the harvest units (as recommended by the SFLMP) through implementation of BMPs, skid trail planning on tractor units, and limiting operations to dry or frozen conditions. Future harvesting opportunities would likely use the same road system, skid trails, and landing sites to reduce additional cumulative impacts. Large woody debris would be retained for nutrient cycling for long-term soil productivity.

  By designing the proposed harvesting operations with soil-moisture restrictions, season of use, and method of harvesting, the risk of unacceptable long-term impacts to soil productivity from compaction and displacement would be low. Because the existing impact is below the goals recommended by the SFLMP and the action alternative would be expected to result in impacts below the recommended level, cumulative effects would likely remain below the 15 percent target.

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WATER RESOURCES ANALYSIS

> ***ECA*** *is a function of total area roaded, harvested, or burned; percent of crown removed during harvesting or wildfire; and amount of vegetative recovery that has occurred in the harvested or burned areas. As live trees are removed, the water that would have evaporated and transpired either saturates the soil or is translated to runoff. This method also estimates the recovery of these increases as new trees revegetate the site and move toward preharvest water use.*

Introduction
This analysis is designed to disclose the existing condition of the hydrologic resources and display the anticipated effects that may result from each alternative of this proposal. During the initial scoping, no issues were identified by the public regarding water quality or quantity or fisheries resources. The following issue statements were expressed from internal comments regarding the effects of proposed timber harvesting:

- Timber harvesting and road construction has the potential to increase water yield, which, in turn, may affect erosive power, sediment production and stream channel stability.
- Timber harvesting and road construction activities may increase sediment delivery into streams and affect water quality.
- Timber-harvesting activities may affect the fish-habitat parameters of large woody debris, channel complexity, stream shading, stream temperature and fish passage at road crossing structures.

These issues can best be evaluated by analyzing the anticipated effects of harvest prescriptions and sediment delivery on the water quality, quantity and fisheries habitat of streams in the project area.

The Environmental Effects sections disclose the anticipated indirect, direct and cumulative effects to water resources within the analysis area from the proposed actions. Past, current, and future planned activities on all ownerships within each analysis area have been taken into account for the cumulative effects analysis. The primary concerns relating to aquatic resources within the analysis area are potential impacts to water quality from sources outside the channel. In order to address these issues the following parameters are analyzed by alternative:

-Miles of new road construction and number of stream crossings
-Potential for sediment delivery to streams from harvest units and roads
-Increase in annual water yield

Analysis Method
Sediment Delivery
The methods applied to the project area to evaluate potential direct, indirect and cumulative effects include a field review to look at potential sediment sources to streams from haul routes. Additionally, data from a recent analysis of sediment delivery from roads completed by the Kootenai National Forest for the Spring Gulch Timber Sale Project (USFS 2011) will be used. Soil types in the project area were reviewed to identify areas prone to sediment delivery. The soil erodibility combined with the proximity to streams will be the method uses to assess the risk of sediment delivery to streams.

Fish Habitat Parameters
Expected effects to fisheries habitat will be addressed qualitatively using the current condition as a baseline, disclosing the expected changes due to the alternatives proposed. The analysis method for woody debris recruitment will evaluate the potential reduction in available woody debris and shading due to timber-harvesting activities. Stream temperature will be addressed by evaluating the risk of stream temperature increases due to reduced shading from existing vegetation.

Water Yield
Annual water yield will be disclosed as a cumulative effect in the *EXISTING CONDITIONS* portion of this report because the existing condition is a result of all past harvesting and associated activities. Annual water yield refers to the gross volume of water in a watershed that is contributed to a stream or other surface water feature. In the *ENVIRONMENTAL EFFECTS* portion of this report, water-yield increases as a result of this project will be

disclosed as a direct effect. The cumulative water-yield increase as predicted to include each alternative will be disclosed as a cumulative effect.

The annual water-yield increase for watersheds in the project area was estimated using the ECA method as outlined in *Forest Hydrology, Part II (Haupt et al, 1976)* or by incorporating previous water yield analysis from other agencies.

In order to evaluate the potential effects of water-yield increases, a threshold of concern for each watershed was established per *ARM 36.11.423*. Thresholds were established based on evaluating the acceptable risk level, resources value, and watershed sensitivity. Increased annual water yields above the threshold of concern result in an increased risk of in-channel erosion and degradation of fisheries habitat.

Analysis Area

Sediment Delivery

The direct and indirect effects analysis area for sediment delivery is limited to the harvest units and roads used for hauling. The cumulative effects analysis area for sediment delivery will be all of the roads in the Deep Creek drainage.

Fish Habitat Parameters

The only fish bearing stream in the project area is the Deep Creek, tributary to Noxon Reservoir on the Clark Fork River. Deep Creek contains bull trout, westslope cutthroat trout, mountain whitefish, brown trout and eastern brook trout(USDA 2011; MFISH 2011). Only westslope cutthroat trout are present upstream of the Blue Slide Road crossing which is an effective fish passage barrier. The analysis area for fisheries habitat parameters is the proposed harvest units immediately adjacent to fish-bearing streams. Fish passage will not be addressed because no stream crossings issues are in the project area except for the crossing the Blue Slide Road.

Water Yield

The analysis area for annual water yield will be the Deep Creek watershed. A small portion of the project area is directly tributary to Noxon Reservoir. Due to the small tributary area to Noxon Reservoir, the potential for impacts from this proposal is very limited.

Water Uses and Regulatory Framework

Water Quality Standards

This portion of the Clark Fork River basin is classified as B-1 by the State of Montana Department of Environmental Quality (DEQ), as stated in the Administrative Rules of Montana (ARM 17.30.607). The water quality standards for protecting beneficial uses in B-1 classified watersheds are located in ARM 17.30.623. Water in B-1 classified waterways is suitable for drinking, culinary and food processing purposes after conventional treatment, bathing, swimming and recreation, growth and propagation of salmonid fishes and associated aquatic life, waterfowl and furbearers, and agricultural and industrial water supply. State water quality regulations prohibit any increase in sediment above naturally occurring concentration in water classified B-1. Naturally occurring means condition or materials present from runoff or percolation over which man has no control or from developed land where all reasonable land, soil and water conservation practices have been applied. Reasonable land, soil and water conservation practices include methods, measures or practices that protect present and reasonably anticipated beneficial uses. The State of Montana has adopted Best Management Practices (BMPs) through its non-point source management plan as the principle means of meeting the Water Quality Standards.

Streamside Management Zone Law (SMZ)

All rules and regulations pertaining to the Streamside Management Zone (SMZ) Law will be followed. An SMZ width of 100 feet is required on Class I and II streams when the slope is greater then 35%. An SMZ width of 50 feet is required when the slope is less than 35%.

Water Quality Limited Waterbodies

Deep Creek nor Noxon Reservoir is listed as a water-quality-limited waterbody in the *2010 303(d)* list (MDEQ 2011). The *303(d)* list is compiled by DEQ as required by *Section 303(d)* of the *Federal Clean Water Act* and the *EPA Water Quality Planning and Management Regulations (40 CFR, Part 130)*. Under these laws, DEQ is required to identify waterbodies that do not fully meet water quality standards, or where beneficial uses are threatened or impaired.

Water Rights and Beneficial Uses
A search of the water rights on the Natural Resources Information System mapping program located at http://maps2.nris.state.mt.us/mapper/ found surface water rights within 3 miles downstream of the project area for irrigation, domestic use, stock watering and recreation.

Fisheries—Threatened, Endangered and Sensitive Species
Westslope cutthroat trout are listed as a Montana Animal Species of Concern with an 'S2" ranking. An 'S2' designation is given to species or subspecies that "…is at risk because of very limited and/or declining numbers, range, and /or habitat, making it vulnerable to global extinction or extirpation in the state."(Montana Natural Heritage Program and Montana Fish Wildlife and Parks. 2009). The Department of Natural Resources and Conservation has also identified westslope cutthroat trout as a sensitive species (Administrative Rule of Montana (ARM) 36.11.436). DNRC is a signatory to the 2007 (interagency) Memorandum of Understanding and Conservation Agreement for Westslope Cutthroat Trout and Yellowstone Cutthroat Trout.

Bull Trout are also listed as a Montana Animal Species of Concern with the same ranking as Westslope cutthroat trout; however bull trout are also listed as 'threatened" by the US Fish and Wildlife Service under the Endangered Species Act. DNRC is a signatory to the 2000 (interagency) Restoration Plan for Bull Trout in the Clark Fork River Basin and Kootenai River Basin, Montana.

EXISTING CONDITION
Sediment Delivery
Within the Deep Creek watershed, there is approximately 9.7 miles of roads including county road and private roads. Current estimated erosion from the tread on these roads was estimated by the USFS Hydrologist during the Spring Gulch Timber Sale Project (USDA 2011). Total erosion from the tread was estimated at 1.5 tons per year. The USFS expects to reduce the erosion on these roads by installing road surface drainage and ditch relief culverts. After the USFS implements the selected alternative on the Spring Gulch Timber Sale Project, the estimated erosion would be reduced to 1.2 tons per year (USDA 2011).

The proposed haul route for this project does not cross or run adjacent to any streams; therefore no sediment delivery was noted from the proposed haul route.

A review of the existing soils in the project area shows erosion potential is low to moderate and the slopes in the project area are generally less than 40 percent. None of the soils are prone to high erosion or landslides.

Fish Habitat Parameters
Recruitable woody debris along Deep Creek has been reduced over the last century due to road construction adjacent to the stream. Despite the riparian harvest, the USFS characterized the woody debris in Deep Creek as abundant (USDA 2011). Stream temperature data for Deep Creek is not available.

Water Yield
A preliminary review of the Deep Creek watershed suggests that the cumulative annual water yield increase is less than 5 percent over pre-settlement levels. This is based upon a review of ownership in the drainage, management in the watershed, past harvesting, wildfire history and the amount of roads.

The USFS manages the majority of the watershed (94%); the State of Montana manages approximately 4% and the remaining 2% is under private ownership. While the State of Montana and private lands has been managed over the years, the majority of the USFS managed lands has been protected for grizzly bear habitat (MA 20A). Most of the watershed (81%) is considered roadless. No indication of wildfires was found in the USFS data since 1980 (LNF 2011).

ENVIRONMENTAL EFFECTS
Description of Alternatives
No Action Alternative
No timber harvest or associated activities would occur under this alternative.

Action Alternative

- Three units totaling approximately 320 acres would be managed with commercial harvest under this alternative. The harvest may be completed under summer or winter conditions. In addition the following road work would occur:
    - approximately 0.5 miles of road construction
    - 2.3 miles would be maintained or have minor drainage improvements installed as necessary
    - 0.6 miles of existing road would be used and obliterated.

Direct and Indirect Effects

Sediment Delivery and Fish Habitat Parameters

No Action Alternative

Under this alternative, no timber harvest or related activities would occur. No direct or indirect impacts to water quality from sediment delivery would be expected. No changes to fisheries habitat parameters (stream temperature and channel complexity) would be expected beyond those that occur naturally.

Action Alternative

Sediment Delivery

Under the action alternative, no new stream crossings would be installed and no existing stream crossings are located on the proposed haul route. New road construction, reconstruction and obliteration of existing roads would take place well away from any surface water Therefore, no increase or reduction in sediment delivery to streams from roads would result from the implementation of this alternative.

Past monitoring of DNRC timber harvests has shown erosion on approximately 6 percent of the sites monitored, although no water-quality impacts from the erosion were found (*DNRC 2005*). These sites were harvested during the summer period and the erosion was attributed to inadequate skid trail drainage. By limiting erosion, the risk of sediment delivery is reduced.

During a review of BMP effectiveness including stream buffer effectiveness, *Raskin et al*, found that 95 percent of erosion features (disturbed soil) greater than 10 meters (approximately 33 feet) from the stream did not deliver sediment. His findings indicated that the main reasons stream buffers are effective include 1) keeping active erosion sites away from the stream, and 2) stream buffers may intercept and filter runoff from upland sites as long as the runoff is not concentrated in gullies or similar features (*Raskin et al 2006*).

No streams are located within 100 feet of the proposed units. Due to the lack of streams near proposed harvest units the risk of sediment delivery to streams from proposed harvest units would be very low.

Fish Habitat Parameters

Because no harvest is proposed within 100 feet of any fish bearing stream—namely the Deep Creek—no reduction in riparian vegetation would result from this alternative. By retaining the vegetation, stream shading would not be reduced and therefore, increases in stream temperature from this alternative would not be expected.

Water Yield-

Approximately 148 ECA would be generated in the Deep Creek watershed and approximately 15 ECA would be generated directly in the Noxon Reservoir watershed. These increases would not likely result in measureable adverse impacts to either body of water due to the small size of the increase in relation to the watershed size.

Cumulative Watershed Effects

Sediment Delivery and Fish Habitat Parameters

No Action Alternative

No additional cumulative effects beyond those described in the existing condition would be expected.

Action Alternative

Sediment Delivery and Fish Habitat Parameters

There would be a very low risk of additional adverse cumulative effects from the implementation of this alternative beyond those described under the existing condition and direct/indirect effects because:

1) All operations would be implemented using appropriate forestry BMPs. This would reduce the potential for soil displacement and subsequent sediment transport, and

2) The lack of stream crossings on proposed haul roads.
3) SMZ harvest would not occur which reduces the potential for soil displacement within the stream buffer.
4) Riparian buffers of 100 feet would be retained which would maintain the available trees for channel complexity and limit the reduction in stream shading.
5) Cumulative annual water yield would remain very low.

In summary, the risk of adverse cumulative effects to water quality and fisheries habitat would be very low if the action alternative were selected.

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WILDLIFE ANALYSIS
INTRODUCTION

The wildlife analysis is designed to disclose the existing condition of wildlife resources and the anticipated direct, indirect, and cumulative effects that may result from implementing the No-Action and Action alternatives presented Chapter 2. The following issue statements were developed from concerns raised by DNRC specialists and public comments received during scoping and will be addressed in the following analysis:

- **Mature forest cover and connectivity.** The proposed activities could decrease mature forested cover, which could reduce habitat connectivity and suitability for wildlife species associated with mature forest.
- **Snags and coarse woody debris.** The proposed activities could reduce the availability of snags and coarse woody debris and increase human access for firewood harvesting, which could adversely affect the quality of wildlife habitat.
- **Grizzly bears.** The proposed activities could alter the availability of grizzly bear visual screening and could increase human access, which could displace bears and increase the risk of human-caused bear mortality.
- **Bald eagles.** The proposed activities could remove large trees and snags and could increase disturbance to bald eagles, which could reduce the quality of bald eagle habitats.
- **Fishers.** The proposed activities could reduce the availability and connectivity of preferred fisher habitats and increase human access, which could reduce habitat suitability and increase trapping mortality.
- **Flammulated owls.** The proposed activities could alter the structure of flammulated owl preferred habitat types, which could reduce habitat suitability for flammulated owls.
- **Gray wolves.** The proposed activities could disturb gray wolves and reduce big game winter range habitat quality, which could displace gray wolves from denning and rendezvous sites and reduce prey availability.
- **Pileated woodpeckers.** The proposed activities could reduce tree density and alter the structure of mature forest stands, which could reduce habitat suitability for pileated woodpeckers.
- **Big game winter range.** The proposed activities could reduce cover, which could reduce the quality of big game winter range habitat.
- **Elk security.** The proposed activities could reduce cover and increase human access, which could reduce the availability of elk security habitat.

ANALYSIS AREAS

Analysis areas are delineated at multiple scales appropriate for analyses of: 1) direct and indirect effects, and 2) cumulative effects. These scales are described in more detail below.

Direct and Indirect Effects Analysis Area

The direct and indirect effects analysis area is the project area (FIGURE W-1 –ANALYSIS AREAS). The project area consists of 420 acres of DNRC managed lands in Section 16, T23N, R30W.

Cumulative Effects Analysis Areas

The cumulative effects analysis area refers to a broad surrounding landscape scale and varies according to the issue or wildlife species being discussed. Cumulative effects analysis areas are summarized in TABLE W-1 – ANALYSIS AREAS (FIGURE W-1 –ANALYSIS AREAS). Cumulative effects analysis areas include the project area as well as lands managed by other agencies and private landowners. Detailed descriptions of each analysis area are located in the **Existing Condition** section for each issue or species being discussed (e.g., snags and coarse woody debris, grizzly bears).

TABLE W-1. ANALYSIS AREAS. Descriptions of the direct and indirect effects analysis area and cumulative effects analysis areas.

ANALYSIS AREA	DESCRIPTION	TOTAL ACRES	ISSUE(S)/SPECIES ANALYZED
Direct & Indirect Effects	Project Area	420	direct & indirect effects for all issues/species
Medium Cumulative Effects	The Deep Creek Subwatershed and portions of the Noxon River-Bear Creek Subwatershed located to the northeast of the Clark Fork River	19,410	fishers, flammulated owls, pileated woodpeckers, big game winter range, elk security habitat
Large Cumulative Effects	The project area and the Vermillion River Grizzly Bear Subunit, which includes the Vermillion River Watershed and portions of the Upper Noxon Reservoir Watershed	92,803	snags and coarse woody debris, mature forested habitats and connectivity, grizzly bears, Canada lynx, gray wolves
Bald Eagle Cumulative Effects	The 2.5 mile radius area surrounding a bald eagle nest located on Noxon Reservoir.	12,566	bald eagles

ANALYSIS METHODS

Analysis methods are based on DNRC *State Forest Land Management Rules* designed to promote biodiversity. Biodiversity is promoted by taking a coarse-filter approach as well as a fine-filter approach. The coarse-filter approach favors an appropriate mix of stand structures and compositions on state lands (*ARM 36.11.404*) and assumes that if landscape patterns and processes are maintained, then a full complement of species would persist and biodiversity would be maintained. Because the coarse-filter approach may not adequately address the full range of biodiversity on DNRC lands, DNRC also employs a complementary fine-filter approach which addresses the habitat requirements of threatened, endangered, and sensitive species (*ARM 36.11.406*).

The coarse-filter wildlife analysis section includes analyses of direct, indirect and cumulative effects of the proposed alternatives on: 1) mature forested habitats and landscape connectivity, and 2) snags and coarse woody debris. Effects to old growth (*Green et al. 1992*) were dismissed from analysis because the project area does not contain old growth. Specialized analysis methods are discussed in each section.

The fine-filter wildlife analysis section includes analyses of the direct, indirect and cumulative effects of the proposed alternatives on: 1) species listed as threatened or endangered under the Endangered Species Act of 1973, 2) species listed as sensitive by DNRC, and 3) species managed as big game by DFWP. Specialized analysis methods are discussed in the sections pertaining to each species.

Existing conditions are described for each relevant species or issue and were assessed with the following techniques: field visits, scientific literature consultation, Montana Natural Heritage Program (MNHP) data queries, DNRC Stand Level Inventory (SLI) data analysis, aerial photograph analysis, and consultation with professionals. Cumulative effects analyses account for all known past and current activities, as well as planned future agency actions and include:

- DNRC 2011 (ongoing) Harlow Dump Timber Sale – Harvest on approximately 227 acres within Section 36, T22N, R30W, and Section 22, T23N, R30W. Open road density would not change following the harvest. The large and bald eagle cumulative effects analysis areas include approximately 79 harvested acres (Units 5 and 6) and the medium cumulative effects analysis area includes approximately 68 harvested acres (Units 5 and 6).
- DNRC 2011 Deep 6 612 Permit – Harvest on approximately 18 acres within Section 16, T23N, R30W. No roads are planned for construction. All activities are located in the northeast portion of the project area.

- USFS harvest Spring Gulch Timber Sale (proposed May 2011, withdrawn October 2011 for further analysis) – Proposed activities include approximately 248 acres of timber harvest, 233 acres of natural fuels treatments, and 68 acres of pre-commercial thinning for a total of 549 treated acres within Sections 3, 4, 9 & 10, T23N, R30W. Prescriptions are subject to change and a revised environmental analysis is expected in spring of 2012. Activities may begin in the summer of 2012 at the earliest (*S. Snell, USFS, personal communication, 2011*). All proposed activities would occur within both the large and medium cumulative effects analysis areas. The bald eagle cumulative effects analysis area would include all activities with the exception of approximately 50 acres of natural fuels reduction treatments.

COARSE-FILTER WILDLIFE ANALYSIS

The coarse-filter wildlife analysis discloses the existing conditions and the anticipated direct, indirect and cumulative effects of the proposed alternatives on: 1) mature forested habitats and landscape connectivity, and 2) snags and coarse woody debris.

MATURE FORESTED HABITATS AND CONNECTIVITY

Issue: **The proposed activities could decrease mature forested cover, which could reduce habitat connectivity and habitat suitability for wildlife species associated with mature forest.**

Introduction

Mature forests characterized by abundant, large diameter trees and dense canopy cover provide many wildlife species with food, shelter, breeding sites, and travel corridors. Historically, the spatial configuration of mature forested habitats in the western United States was shaped by natural disturbance events, primarily wildfire, blowdown, and pest outbreaks. Natural disturbance events resulted in a mosaic-like spatial configuration of forest patches varying in age, species composition and development. Spatial configuration, including patch size and connectivity of forested habitats, is important for many wildlife species. Patch size may affect the distribution wildlife species that are attracted to, or avoid forest edges. Additionally, connectivity of mature forested habitats may facilitate movements of species that avoid openings in canopy cover, or inhibit movements of species that are attracted to openings in canopy cover. For example, discontinuous mature forested habits would negatively affect movements of fisher, which avoid large openings in canopy cover.

Timber harvest, like wildfire and blowdown, is a disturbance event that often creates open patches of young, early-successional habitats. Consequently, timber harvest may negatively affect wildlife species dependent on mature forests by reducing the amount and connectivity of these habitats. Conversely, wildlife species adapted to early-successional habitats may benefit from timber harvests and similar natural disturbance events. The following analysis discloses existing conditions and the anticipated direct, indirect, and cumulative effects of the proposed activities on mature forested habitats and connectivity.

Analysis Area

The analysis area for direct and indirect effects is the project area (FIGURE W-1 –ANALYSIS AREAS). The analysis area for cumulative effects is the large cumulative effects area described in TABLE W-1 –ANALYSIS AREAS (FIGURE W-1 –ANALYSIS AREAS). The large cumulative effects analysis area represents an area large enough to support a diversity of species that use mature forested habitats and/or require connected forested habitats.

Analysis Methods

Analysis methods for mature forested habitats and landscape connectivity include field evaluations and Geographical Information System (GIS) analysis of aerial-photographs and USFS canopy cover data (VMap 9.1.1). Mature forested habitat is defined here and in the remainder of the document as forest stands with ≥40% canopy cover comprised primarily of trees that are on average >9 inches dbh. Forested stands containing trees of at least this size and density were considered adequate for providing minimal conditions necessary to facilitate movements of many wildlife species that benefit from well-connected mature forest conditions across the landscape. Factors considered in the analysis include: 1) the degree of timber harvesting, 2) availability of

mature forested habitats (≥40% canopy cover, >9 inches dbh), 3) average patch size, 4) open and restricted road density, and 5) the availability of potential travel corridors.

Existing Conditions

Mature Forested Habitats and Connectivity

The project area currently contains approximately 155 acres of mature stands of Douglas-fir, ponderosa pine, and mixed conifers (TABLE W-2 –MATURE FOREST). Average patch size is relatively small (average: 78 acres, range: 3-152 acres); however, the majority of mature forested habitat is continuous and located in the northern portion of the analysis area (FIGURE W-1 –ANALYSIS AREAS). Canopy cover in this area is high (85%) and likely facilitates use by species requiring connected mature forested habitats. The project area does not occur in any particular area of documented importance for habitat connectivity; however, riparian habitat associated with Deep Creek likely facilitates wildlife movements and connects the project area to mature forested habitats on Lolo National Forest Lands located northeast of the project area. The habitat associated with the Deep Creek Drainage is part of a Lolo National Forest 20A land management area, in which road construction is allowed, but few roads are left open to the public (*USFS, 1986*). Additionally, wildlife likely travel between mature forested habitats located in the northern portion of the project area and Kootenai National Forest lands. High open road density has compromised the quality and connectivity of mature forest habitat in the project area. Open road density in the project area is 4.1 miles/square mile and includes the high traffic-volume Blue Slide County Road. The density of all roads in the project area is 6.4 miles/square mile.

The large cumulative effects analysis area currently contains approximately 43,018 acres of mature stands (≥40% canopy cover, >9 inches dbh) of mixed conifers (TABLE W-2 –MATURE FOREST). Mature forested habitat exists in scattered small to large patches (average: 295 acres, range: 4-12,264 acres). In the vicinity of the project area, mature forested patches are generally smaller and less connected that mature patches located in the northern portion of the large cumulative effects analysis area. However large patches of mature forested habitat are available on Kootenai National Forest lands north of the project area and Lolo National Forest lands in the Deep Creek drainage northeast of the project area. The Deep Creek Drainage contains Lolo National Forest Management Area 20A lands, which are considered grizzly bear habitat unsuitable for timber harvest (*USFS, 1986*). In this area, road construction is allowed, but few roads are left open to the public. The Deep Creek area is most likely a travel corridor for wildlife requiring mature forested canopy cover. Across the analysis area, additional creeks including the Vermillion River and smaller streams provide additional wildlife travel corridors. However, the network of open roads (Blue Slide Road, Vermillion Creek Road, and others) may inhibit movement of wildlife, especially in the northeast portion of the analysis areas where open road density is high. However overall, open road density in the analysis area is relatively low at 1.2 miles/square mile open (1.4 miles/square mile density of all roads).

TABLE W-2 -MATURE FOREST. Mature forested habitat (≥40% canopy cover, >9 inches dbh) existing condition and expected post-harvest condition (acres). Percent of the total analysis area is in parentheses.

ANALYSIS AREA	EXISTING AVERAGE PATCH SIZE	EXISTING MATURE FOREST	POST-HARVEST MATURE FOREST
Direct & indirect effects	78	155 (37%)	155 (37%)
Cumulative effects	295	43,018 (46%)	43,018 (46%)

Environmental Effects

Direct and Indirect Effects of the No-Action Alternative on Mature Forested Habitats and Connectivity

None of the proposed forest management activities would occur. Forest conditions would continue to age, and dense stands of shade-tolerant trees would continue to develop. Patch size and the availability of mature forested habitat may increase over time, slightly increasing connectivity. Thus, since: 1) no appreciable change in the availability of mature forested habitat would occur, 2) no changes in open or restricted road density would

occur, and 3) no changes in the availability of travel corridors would occur, no direct or indirect effects to mature forested habitat availability and connectivity would be anticipated as a result of the No-Action Alternative.

Direct and Indirect Effects of the Action Alternative on Mature Forested Habitats and Connectivity

Mature forested habitat is located in the northern portion of the analysis area and is characterized by high canopy cover (85%). The shelterwood cut proposed for this area would open the stand. However, 55-65% canopy cover would be retained, and hence, no change in the availability and connectivity of mature forested habitat would be expected. In the southern portion of the project area canopy cover is low and proposed activities would not affect the availability of mature forested habitats. Approximately 0.2 mile of open road would be constructed, but an additional 0.3 miles of currently open roads would be closed and overall, open road density would decrease. Open road density would be reduced from 4.1 miles/square mile to 3.8 miles/square mile. No harvesting is proposed within the riparian habitat and potential travel corridor associated with Deep Creek. Thus, since: 1) no appreciable change in the availability of mature forested habitat would occur, 2) proposed activities in the northern portion of the project area would reduce canopy cover by 20-30%, but would retain ≥40% canopy cover, 3) open road density would decrease following the closure of illegal trails, and 4) no changes in the availability of travel corridors would occur, minor direct or indirect effects to mature forested habitat availability and connectivity would be anticipated as a result of the Action Alternative.

Cumulative Effects of the No-Action Alternative on Mature Forested Habitats and Connectivity

None of the proposed forest management activities would occur. Forest conditions in the project area would continue to age, and dense stands of shade-tolerant trees would continue to develop. Connectivity would not be affected under this alternative. Any proposed or ongoing activities on other ownerships may affect the availability and connectivity of mature forested habitats in the large cumulative effects analysis area. Thus, since: 1) no appreciable change in the availability of mature forested habitat would occur, 2) no changes in open or restricted road density would occur, and 3) no changes in the availability of travel corridors would occur, no cumulative effects to mature forested habitat availability and connectivity would be anticipated as a result of the No-Action Alternative.

Cumulative Effects of the Action Alternative on Mature Forested Habitats and Connectivity

Across the cumulative effects area, mature forested habitats and connectivity would persist. Approximately, 55-65% canopy cover would be retained in the northern portion of the proposed project area, and hence, no change to the availability and connectivity of mature forested habitat would be expected. Proposed canopy cover and stand density reduction would be additive to harvest activities that are proposed and ongoing in the cumulative effects analysis area including the DNRC Harlow Dump (ongoing), the DNRC Deep 6 612, and the USFS Spring Gulch (proposed) (see **ANALYSIS METHODS** section of the Introduction for a detailed description of projects). Of these projects, the USFS Spring Gulch sale is the only sale that would reduce the availability of mature forested habitat. The DNRC Harlow Dump sale is expected to reduce canopy cover, but the area did not contain high canopy cover prior to harvest (≥40%) and the DNRC Deep 6 612 would retain 55-65% canopy cover and is not expected to adversely affect mature forested habitat. The USFS Spring Gulch project proposes 88 acres of regeneration treatments (i.e. seed tree with reserves, shelterwood with reserves). Due to the limited distribution of these treatments, the affect on mature forested habitat and connectivity would be minimal. Open road density would decrease slightly following the closure of illegal roads on DNRC lands. No harvesting is proposed within the riparian habitat and potential travel corridor associated with Deep Creek. Thus, since: 1) no appreciable change in the availability of mature forested habitat would occur, 2) the proposed activities would reduce canopy cover, but would retain ≥40% canopy cover in areas where mature forested habitat occurs, 3) open road density would decrease slightly following the closure of illegal roads, and 4) no changes in the availability of travel corridors would occur, minor cumulative effects to mature forested habitat availability and connectivity would be anticipated as a result of the Action Alternative.

SNAGS AND COARSE WOODY DEBRIS

Issue**: The proposed activities could reduce the availability of snags and coarse woody debris and increase human access for firewood harvesting, which could adversely affect the quality of wildlife habitat.**

Introduction

Snags and coarse woody debris are important components of forest ecosystems that provide the following functions: 1) increase structural diversity, 2) alter the canopy microenvironment, 3) promote biological diversity, 4) provide important habitat substrates for wildlife, and 5) act as storehouses for nutrient and organic matter recycling agents (*Parks and Shaw 1996*). Snags and defective trees (i.e. partially dead, spike top, broken top) are used by a wide variety of wildlife species for nesting, roosting, and cover. Primary cavity users (i.e. woodpeckers) excavate nesting and roosting cavities in snags. These cavities are used as nesting, roosting, and resting sites by a variety of secondary cavity users, such as small mammals and birds, which are unable to excavate their own cavities. Snags also provide foraging opportunities for insectivorous wildlife species. Snag-habitat value for wildlife varies according to tree species, diameter, and snag density. Thick-barked species (such as western larch and ponderosa pine) tend to provide high quality snag habitat. Snag diameter is important because many species that nest in smaller diameter snags will also use large snags; however, the opposite is not true. Additionally, many cavity-nesting species prefer high density snag habitat and rely on adjacent snags for foraging opportunities.

Coarse woody debris is used by a variety of wildlife species for foraging, shelter, lookout sites, and food storage. Additionally, coarse woody debris provides forest-dwelling amphibians and reptiles with a stable environment (i.e. moisture and temperature). Coarse woody debris habitat value varies according to size, length, decay, and distribution of coarse woody debris. Single, scattered downed trees may provide access under the snow for small mammals and weasels, while log piles may provide secure areas for snowshoe hares.

Timber harvest may affect the abundance and spatial distribution of snags and coarse woody debris by direct removal or by increasing human access for firewood harvesting. The following analysis discloses existing conditions and the anticipated direct, indirect, and cumulative effects of the proposed activities on coarse woody debris and snags.

Analysis Area

The analysis area for direct and indirect effects is the project area (FIGURE W-1 –ANALYSIS AREAS). The analysis area for cumulative effects is the large cumulative effects analysis area described in TABLE W-1 –ANALYSIS AREAS (FIGURE W-1 –ANALYSIS AREAS). The large cumulative effects analysis area represents an area large enough to support a diversity of species that use coarse woody debris and snags.

Analysis Methods

Analysis methods for snag and coarse woody debris include field assessments at 9 study plots according to protocols modified from the *State Forest Land Management Implementation Guidance* (*Montana DNRC, 2000*). Factors considered in the analysis include 1) the level of harvesting, 2) availability of snags and coarse woody debris, and 3) risk of firewood harvesting.

Existing Conditions

Snags and Coarse Woody Debris

Low snag density and limited coarse woody debris was observed during field assessments. Coarse woody debris and snags per acre were approximately 3.0 tons/acre (range: 0-8.6 tons/acre) and 3.7 snags/acre (range: 0-19.8 snags/acre; ≥8 inches dbh), respectively. The majority of snags sampled were small (10.0-13.0 inch dbh) Douglas-fir and grand fir located in the northwest portion of the project area, and thus have limited value for wildlife. Cavity construction was observed in Douglas-fir snags and evidence of feeding was observed on grand fir snags. Firewood cutting risk is currently high due to the presence of open roads in the analysis area (4.1 miles/square mile open road density, 6.4 miles/square mile total road density). The Blue Slide County road traverses the southern portion of the project area, providing access for firewood cutting. Legal and illegal

motorized human access has likely reduced the availability of coarse woody debris and snags in the project area.

In the large cumulative effects analysis area, snag and coarse woody debris levels on surrounding parcels vary widely depending on ownership, motorized access, harvest history, and natural disturbance history. Snags and coarse woody debris are frequently collected for firewood, especially near open roads, and firewood gathering occurs in the large cumulative effects analysis area. Overall, road density in the large cumulative effects analysis area is low (1.2 miles/square mile open road density, 1.4 miles/square mile total road density) and provides limited accessibility for firewood cutting. The Blue Slide County Road traverses the southern portion of the analysis area, providing access to this area. The Vermillion Creek Road and additional open roads provide accessibility to the northern and eastern portion of the large cumulative effects analysis area.

Environmental Effects

Direct and Indirect Effects of the No-Action Alternative on Snags and Coarse Woody Debris

None of the proposed forest management activities would occur. Existing snags would continue to provide wildlife habitats, and new snags would be recruited as trees die. Thus, since: 1) no timber harvesting would alter present or future snag or coarse woody debris abundance, and 2) no changes to human access for firewood harvesting would occur, no direct and indirect effects to snags and coarse woody debris availability associated with wildlife habitat quality would be anticipated as a result of the No-Action Alternative.

Direct and Indirect Effects of the Action Alternative on Snags and Coarse Woody Debris

Some existing snags and snag recruits would be removed from the 320 acres within project area due to timber felling operations and removal of diseased trees. Additional recruitment trees and snags may also be lost in the short term following treatments due to wind throw. Due to the residential nature of the project area, human safety would be a concern when selecting snags for retention. Given operability and human safety constraints, existing non-merchantable snags would be left standing where possible on DNRC lands. Across the project area, at least 1 large snag and 1 large recruitment tree (>21 inches dbh) per acre would be retained on DNRC harvest units (*ARM 36.11.411*). If such large trees and snags are absent, the largest available snags and/or recruitment trees would be retained. Additionally, coarse woody debris would be retained according to DNRC administrative rules (*ARM 26.11.414*). Post-harvest, the proposed actions may improve the quality of snags available to wildlife by encouraging the development of larger diameter trees. Firewood cutting risk in the project area would be reduced following the proposed harvest. Approximately 0.2 miles of new open road would be constructed, but 0.3 miles of currently open roads would be closed and open road density would be reduced from 4.1 miles/square mile to 3.8 miles/square mile. No restricted roads are planned for construction. Thus, since: 1) proposed actions would remove some snags and coarse woody debris 2) open road density and human access for firewood harvesting would be reduced, and 3) snags and coarse woody debris would be retained to meet DNRC administrative rules (*ARM 36.11.411, ARM 26.11.414*), minor adverse direct and indirect effects to snags and coarse woody debris availability associated with wildlife habitat quality would be anticipated as a result of the Action Alternative.

Cumulative Effects of the No-Action Alternative on Snags and Coarse Woody Debris

None of the proposed forest management activities would occur. No changes in the availability of snags and coarse woody debris would be expected. Existing snags would continue to provide wildlife habitats, and new snags would be recruited as trees die. Any proposed and ongoing activities on other ownerships may affect the availability of snags and coarse woody debris. Thus, since: 1) no timber harvesting on DNRC lands would alter present or future snag or coarse woody debris abundance, and 2) no changes to human access for firewood harvesting would occur on DNRC lands, no cumulative effects to snags and coarse woody debris availability associated with wildlife habitat quality would be anticipated as a result of the No-Action Alternative.

Cumulative Effects of the Action Alternative on Snags and Coarse Woody Debris

Some existing snags and snag recruits would be removed from the 320 acres proposed for harvest within project area, but retention guidelines would apply (*ARM 36.11.411, ARM 26.11.414*). In the large cumulative effects analysis area, 3 projects (DNRC Harlow Dump Timber Sale, DNRC Deep 6 612 Permit, and the USFS Spring Gulch Timber Sale) would be expected to contribute to cumulative effects (see **ANALYSIS METHODS** section of the Introduction for a detailed description of projects). The DNRC Harlow Dump Timber Sale (79 harvested acres occur within the analysis area) and the Deep 6 612 harvest (18 acres, occur within the project area) are expected to have a minor adverse effect of snags and coarse woody debris; although retention of

deadwood would meet DNRC administrative rules (*ARM 36.11.411, ARM 26.11.414*). The USFS Spring Gulch (549 acres) is proposed and may occur at the earliest in the spring of 2012. Under the proposal, 10-15 tons per acre of coarse woody debris, 1-2 snags per acre, and 2-4 snag recruits would be retained (*USFS 2011*). Firewood cutting risk would be expected to decrease slightly under the Action alternative because approximately 0.2 miles of open road would be constructed, but 0.3 miles of currently open roads would be closed. Additionally, no open roads would be constructed under any of the other proposed and ongoing sales occurring within the large cumulative effects analysis area. Thus, since: 1) proposed actions would be additive to ongoing and proposed activities that would remove some snags, snag recruits, and coarse woody debris, 2) snags and coarse woody debris on adjacent projects have been or will be retained, and 3) human access for firewood harvesting would be slightly reduced following the closure of illegal roads, minor cumulative effects to snags and coarse woody debris availability associated with wildlife habitat quality would be anticipated as a result of the Action Alternative.

FINE-FILTER WILDLIFE ANALYSIS

The fine-filter wildlife analysis discloses the existing conditions of wildlife resources and the anticipated direct, indirect, and cumulative effects that may result from the No-Action and Action Alternatives described in Chapter 2. Wildlife species considered include: 1) species listed as threatened or endangered under the Endangered Species Act of 1973, 2) species listed as sensitive by DNRC, and 3) species managed as big game by DFWP. TABLE W-3 –FINE-FILTER describes how each species was either included in the following analysis, or removed for further analysis due to lack of suitable habitat or failure of proposed activities to affect required habitat components.

TABLE W-3 –FINE-FILTER. Status of species considered in the fine-filter wildlife analysis and basis for inclusion or exclusion in further analysis.

	SPECIES/HABITAT	DETERMINATION – BASIS
Threatened and Endangered Species	Canada lynx (*Felis lynx*) Habitat: Subalpine fir habitat types, dense sapling, old forest, deep snow zones	No potential lynx habitat occurs within the project area. Thus, no direct, indirect, or cumulative effects to Canada lynx would be expected to occur as a result of either alternative.
	Grizzly bear (*Ursus arctos*) Habitat: Recovery areas, security from human activity	***Included*** – The project area is considered grizzly bear non-recovery occupied habitat (*Wittinger* 2002) and the project area borders the Vermilion grizzly bear subunit of the Cabinet-Yaak Ecosystem (*USFWS 1993*). Additionally, a grizzly bear was captured near the project area on the Blue Slide Road in 2011.
Sensitive Species	Bald eagles (*Haliaeetus leucocephalus*) Habitat: Late-successional forest less than 1 mile from open water	***Included*** – A bald eagle nest is located within the project area.
	Black-backed woodpeckers (*Picoides arcticus*) Habitat: Mature to old burned or beetle-infested forest	No recently (<5 years) burned areas occur in the project area. Thus, no direct, indirect, or cumulative effects to black-backed woodpeckers would be expected to occur as a result of either alternative.
	Coeur d'Alene salamanders (*Plethodon idahoensis*) Habitat: Waterfall spray zones, talus near cascading streams	No moist talus or streamside talus habitat occurs in the project area. Thus, no direct, indirect, or cumulative effects to Coeur d'Alene salamanders would be expected to occur as a result of either alternative.

	Columbian sharp-tailed grouse (*Tympanuchus Phasianellus columbianus*) Habitat: Grassland, shrubland, riparian, agriculture	No suitable grassland communities occur in the project area. Thus, no direct, indirect, or cumulative effects to Columbian sharp-tailed grouse would be expected to occur as a result of either alternative.
	Common loons (*Gavia immer*) Habitat: Cold mountain lakes, nest in emergent vegetation	No suitable lake habitats occur within the project area. Thus, no direct, indirect or cumulative effects to common loons would be expected to occur as a result of either alternative.
	Fishers (*Martes pennanti*) Habitat: Dense mature to old forest less than 6,000 feet in elevation and riparian	***Included*** – Approximately 47 acres of preferred fisher habitat types occur within the project area.
	Flammulated owls (*Otus flammeolus*) Habitat: Late-successional ponderosa pine and Douglas-fir forest	***Included*** – Approximately 121 acres of suitable flammulated owl habitat occur within the project area.
	Gray wolves (*Canis lupus*) Habitat: Ample big game populations, security from human activities	***Included*** – The project area is located approximately 2.0 miles from the 2010 annual home range of the Silcox Pack.
	Harlequin ducks (*Histrionicus histrionicus*) Habitat: White-water streams, boulder and cobble substrates	No suitable high-gradient stream or river habitats occur in the project area. No direct, indirect or cumulative effects to harlequin ducks would be expected to occur as a result of either alternative.
	Northern bog lemmings (*Synaptomys borealis*) Habitat: Sphagnum meadows, bogs, fens with thick moss mats	No suitable sphagnum bogs or fens occur in the project area. Thus, no direct, indirect, or cumulative effects to northern bog lemmings would be expected to occur as a result of either alternative.
	Peregrine falcons (*Falco peregrinus*) Habitat: Cliff features near open foraging areas and/or wetlands	No suitable cliffs/rock outcrops occur in the project area. Thus, no direct, indirect, or cumulative effects to peregrine falcons would be anticipated as a result of either alternative.
	Pileated woodpeckers (*Dryocopus pileatus*) Habitat: Late-successional ponderosa pine and larch-fir forest	***Included*** – Approximately 60 acres of suitable pileated woodpecker habitat occur within the project area.
	Townsend's big-eared bats (*Plecotus townsendii*) Habitat: Caves, caverns, old mines	No suitable caves or mine tunnels are known to occur in the project area. Thus, no direct, indirect or cumulative effects to Townsend's big-eared bats are anticipated as a result of either alternative.
Big Game Species	Elk (*Cervus canadensis*)	***Included*** – The project area is considered elk, mule deer, and white-tailed deer winter range (*unpublished interagency map, 2008*). The project area is considered elk security habitat.
	Mule Deer (*Odocoileus hemionus*)	
	White-tailed Deer (*Odocoileus virginianus*)	

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THREATENED AND ENDANGERED SPECIES

GRIZZLY BEAR

Issue**: The proposed activities could alter the availability of grizzly bear visual screening and could increase human access, which could displace bears and increase the risk of human-caused bear mortality.**

Introduction

Grizzly bears are opportunistic omnivores that inhabit a variety of habitats in Montana. Preferred grizzly bear habitats include meadows, riparian zones, avalanche chutes, subalpine forests, and big game winter ranges, all of which provide seasonal food sources. Grizzly bears are currently listed as Threatened under the *Endangered Species Act of 1973* and primary threats are related to human-bear conflicts and long-term habitat loss associated with human development (*Mace and Waller 1997a*). Forest management considerations for grizzly bears include providing visual screening along open roads and reducing disturbance levels during the non-denning season.

Analysis Area

The analysis area for direct and indirect effects is the project area (FIGURE W-1 –ANALYSIS AREAS). The analysis area for cumulative effects is the large cumulative effects analysis area described in TABLE W-1 –ANALYSIS AREAS (FIGURE W-1 –ANALYSIS AREAS). The large cumulative effects analysis area represents an area large enough to support 2-3 female grizzly bear home ranges (*Mace and Waller 1997b*).

Analysis Methods

Analysis methods include field evaluations, Geographical Information System (GIS) of SLI data, and aerial photograph interpretation to identify potential hiding cover and estimate open and restricted road density. Grizzly bear hiding cover is defined as vegetation that could hide 90% of a grizzly bear at a distance of 200 feet. Visual screening for hiding cover was identified by evaluating forest stand size class and the total crown density of all trees in the stand. Seedlings/sapling stands are included in hiding cover estimates if they are >4 feet tall and contain ≥350 trees/acre. On non-DNRC lands the acreage of stands with ≥40% canopy cover provided by trees >9 inches dbh was queried to estimate the availability of hiding cover. Factors considered in the analysis included: 1) the degree of harvesting, 2) the availability of visual screening for hiding cover, and 3) open and restricted road density.

Existing Conditions

Grizzly Bears

The project area borders the Vermillion Subunit of the Cabinet-Yaak Ecosystem (CYE) Bear Recovery Zone (*USFWS 1993*) and is considered non-recovery occupied habitat as mapped by grizzly bear researchers and managers to address increased sightings and encounters of grizzly bears in habitats outside of recovery zones (*Wittinger 2002*). There are no records of grizzly bears in the analysis area (MNHP tracker data); however, a male grizzly was trapped and relocated from the vicinity of the project area after the bear killed domestic pigs in 2011. Use of the project area by grizzly bears is likely. Approximately 196 acres of visual screening for hiding cover is available in the project area. Low elevation riparian habitat can provide important foraging habitat for bears, especially in the spring (*Servheen 1983*). Such riparian habitat associated with Deep Creek is available in the southeast portion of the project area. Other important grizzly bear habitats including berry patches and avalanche chutes are unavailable in the project area. Currently, open road density in the proposed project area is high at approximately 4.1 miles/square mile including 0.7 miles of the Blue Slide County Road, which traverses the southern portion of the project area. The density of all roads in the project area is 6.4 miles/square mile.

The large cumulative effects analysis area contains 90,582 acres of CYE Bear Recovery Zone habitat (*USFWS 1993*) and 2,220 acres of non-recovery occupied habitat (*Wittinger 2002)*. The MNHP Tracker Database contains no additional records of grizzly bears in the cumulative effects analysis area; however, a grizzly bear was captured and removed from the vicinity of the project area in the summer of 2011, hence, use of the large cumulative effects analysis area by grizzlies is likely. Approximately 448 acres of visual screening for hiding cover is available on DNRC-managed lands across the large cumulative effects analysis area, and approximately 43,018 acres of mature forested habitat exists on other neighboring ownerships. The project

area is situated between high quality grizzly bear habitat and low quality grizzly bear habitat (based on open road density, and proximity to human development). The Deep Creek Drainage located northeast of the project area contains Lolo National Forest Management Area 20A lands, which are considered grizzly bear habitat unsuitable for timber harvest (*USFS 1986*). In this area, road construction is allowed, but few roads are left open to the public. However, the area south of the project area associated with the Blue Slide Road is a residential area, which poses a risk to grizzly bears (e.g., attractants such as garbage and domestic animals). Currently, open road density in the large cumulative effects analysis area is low at approximately 1.2 miles/square mile and the density of all roads is 1.4 miles/square mile.

Environmental Effects

Direct and Indirect Effects of the No-Action Alternative on Grizzly Bears

None of the proposed forest management activities would occur. No changes to grizzly bear habitat would be expected. Visual screening for hiding cover and open and restricted road density would remain the same. Thus, since: 1) no timber harvesting would alter present visual screening, and 2) no changes to open or restricted road density would occur, no direct or indirect effects associated with grizzly bear displacement or human-caused bear mortality risk would be anticipated as a result of the No-Action Alternative.

Direct and Indirect Effects of the Action Alternative on Grizzly Bears

The project area currently contains 196 acres of visual screening for hiding cover. Of these acres, 145 acres (73.9%) of hiding cover would be affected by the proposed activities. The proposed harvest would reduce canopy cover from 85% to 55-65% (Units 2, 3, and 4), potentially reducing the effectiveness of grizzly bear visual screening. Logging equipment could remove some shrubs and other herbaceous materials currently providing visual screening, although vegetation and would be retained where possible, especially near open roads. No riparian harvest would occur and open road density would be reduced. Approximately 0.2 miles of open road would be constructed, but 0.3 miles of currently open roads would be closed, reducing open road density from 4.1 miles/square mile to 3.8 miles/square mile. Additionally, contract requirements would assist in mitigating bear-human conflict risk by specifying that contractors are not permitted to carry firearms on the work site and that unnatural attractants (e.g., garbage) must kept/disposed of in a bear-resistant manner. The proposed activities would occur primarily in the fall and winter (August 16 – March 31), for approximately 18 months (over 3 years). This time period overlaps with the grizzly denning period; hence, grizzly bears could be affected by the 10.5 months of activity that fall outside of the denning period (*ARM 36.11.403(22)*). Thus, since: 1) some canopy cover and shrubs providing visual screening would be removed, but visual screening would be retained where possible, 2) open road density would decrease following the closure of illegal roads, minor adverse direct or indirect effects associated with grizzly bear displacement or human-caused bear mortality risk would be anticipated as a result of the Action Alternative.

Cumulative Effects of the No-Action Alternative on Grizzly Bears

None of the proposed forest management activities would occur. No changes to grizzly bear habitat would be expected. Visual screening for hiding cover and open road density would remain the same within the project area, but may change on other ownerships. Thus, since: 1) no timber harvesting would alter present visual screening, and 2) no changes to restricted or open road density would occur, no cumulative effects associated with grizzly bear displacement or human-caused bear mortality risk would be anticipated as a result of the No-Action Alternative.

Cumulative Effects of the Action Alternative on Grizzly Bears

The proposed activities would reduce the quantity and quality of grizzly bear hiding cover by removing canopy cover, shrubs, and herbaceous plants providing visual screening for hiding cover, although vegetation would be retained where possible, especially near open roads. The proposed activities would be additive to past, ongoing, and proposed activities occurring in the analysis area (DNRC Harlow Dump, DNRC Deep 6 612, USFS Spring Gulch; see **ANALYSIS METHODS** section of the Introduction for a detailed description of projects) as well as existing levels of disturbance associated with residential areas associated with the Blue Slide Road. The DNRC Harlow Dump timber sale (ongoing) will affect 79 acres of grizzly bear visual screening and the DNRC

Deep 6 612 (2011, occurred within the project area) will reduce visual screening on approximately 18 acres. The USFS Spring Gulch timber sale (proposed) could also reduce grizzly bear hiding cover, although the project is not likely to adversely affect grizzly bears (*USFS 2011*). These projects would not change open road density following the completion. The proposed DNRC Deep Blue sale would construct approximately 0.2 miles of open road, but would close an additional 0.3 miles of currently open roads, slightly reducing open road density in the analysis area. If present in the vicinity of the project area, grizzly bears could be displaced during the approximately 10.5 months of proposed activities that would occur outside of the denning period (*ARM 36.11.403(22)*). Thus, since: 1) reduced quality and quantity of visual screening would be additive to proposed and ongoing timber harvest, 2) visual screening would be retained in the project area, especially near open roads, and 3) open road density would slightly decrease, minor adverse cumulative effects associated with grizzly bear displacement or human-caused bear mortality risk would be anticipated as a result of the Action Alternative.

SENSITIVE SPECIES

BALD EAGLES

Issue**: The proposed activities could remove large trees and snags and could increase disturbance to bald eagles, which could reduce the quality of bald eagle habitats.**

Introduction

Bald eagles are diurnal raptors associated with significant bodies of water, such as rivers, lakes, and coastal zones. The diet of the bald eagle consists primarily of fish and waterfowl, but may also include carrion and items taken from other birds of prey. Bald eagles generally require large snags or mature trees for nest construction and hunting perches; however, eagles may also construct nests on cliffs. Forest-management considerations for bald eagles include restricting disturbance during the breeding season and retaining large trees and snags within bald eagle territories.

Analysis Area

The analysis area for direct and indirect effects is the project area (FIGURE W-1 –ANALYSIS AREAS). The analysis area for cumulative effects is the bald eagle cumulative effects analysis area described in TABLE I (FIGURE W-1 –ANALYSIS AREAS).

Analysis Methods

Analysis methods include field evaluations, aerial photograph interpretation, and Geographical Information System (GIS) analysis of bald eagle habitat including nest site areas, primary use areas, and home ranges (*ARM 36.11.429*). Bald eagle habitats are defined according to distance from active nests (i.e. nests that have been active within the preceding 5 years (*ARM 36.11.403(2)*). Nest site areas are located within a 0.25 mile radius of nests and bald eagle primary use areas are located within a 0.25 to 0.5 mile radius of nests. Bald eagle home range habitat is located within 2.5 mile radius of nests and includes nest site habitat and primary use habitat. Factors considered in the analysis include 1) the degree of harvesting, 2) the location of known bald eagle nests, 3) bald eagle habitat characteristics, and 4) disturbance levels, including the proximity of bald eagle habitats to open roads and harvest units.

Existing Conditions

Bald Eagles

The project area contains an active bald eagle nest, which is located on the north shore of Noxon Reservoir. The nest was first documented in the summer of 2011 and may be a new territory, so the average nest success for the last 5 years is unknown (*K. DuBois, Wildlife Biologist, 2011, personal communication)*. In 2011, 2 well-developed chicks were observed in the nest and it is likely that the chicks fledged. Land ownership, of bald eagle habitats is summarized in TABLE W-4 –BALD EAGLE. Within DNRC-managed portions of the bald eagle habitats, approximately 3.7 snags/acre are available (see *SNAGS AND COARSE WOODY DEBRIS* under the Coarse Filter analysis for additional details). The nest is located 0.2 miles from the Blue Slide Road. Noise from traffic may disturb nesting eagles; however, topography and vegetation provide substantial visual screening.

The bald eagle cumulative effects analysis area contains 805 acres (1.6% analysis area) of DNRC-managed land classified as bald eagle home range (includes nest site and primary use habitat). The remaining ownership

within the bald eagle home range area is summarized in (TABLE W-4 –BALD EAGLE). The majority of breeding activities are likely to occur on nest site habitat and primary use habitat. DNRC manages the majority of the nest site habitat (55 acres, 63.1%) and a portion of the primary use habitat (92 acres, 27.3%). Within all bald eagle habitat types, Noxon Reservoir provides important foraging habitat. The Blue Slide Road and Highway 200 run parallel to Noxon Reservoir and may disturb nesting eagles if vegetative screening is not present.

TABLE W-4 –BALD EAGLE. Land ownership (acres, percent of total area in parentheses) of bald eagle habitat types within the bald eagle home range area.

OWNERSHIP	BALD EAGLE BREEDING HABITAT TYPE		
	NEST SITE	PRIMARY USE	HOME RANGE
Montana DNRC	55 (63.1%)	92 (27.3%)	805 (6.7%)
Private	32 (36.9%)	244 (72.7%)	7,450 (62.1%)
Stimson Lumber	0	0	349 (2.9%)
USFS	0	0	3,393 (28.3%)
Total	***87***	***366***	***11,997***

Environmental Effects

Direct and Indirect Effects of the No-Action Alternative on Bald Eagles

None of the proposed forest management activities would occur. Timber harvest would not occur within DNRC-managed bald eagle habitats. Bald eagle habitats would persist and disturbance levels would remain the same. Thus, since: 1) no change in bald eagle habitat characteristics would occur, and 2) no increased disturbance levels would occur, no direct or indirect effects to bald eagle eagles associated with nesting habitat quality or disturbance risk would be anticipated as a result of the No-Action Alternative.

Direct and Indirect Effects of the Action Alternative on Bald Eagles

The proposed timber harvest would affect 31 acres of bald eagle nest site habitat, 75 acres of bald eagle primary use habitat, and an additional 314 acres of bald eagle home range habitat (total habitat: 320 acres, 76.2% of bald eagle habitats in the project area). Within the nest site habitat, light harvest of diseased and insect-damaged trees would occur, but the overall structure and ecological integrity of the habitat would be maintained (*ARM 36.11429(1)(c)(ii)*). To provide vegetative screening between the eagle nest and the Blue Slide Road, 7 acres would not be harvested. Within primary use habitat, moderate harvest of diseased and insect-damaged trees would occur, but overall structure and ecological integrity of the habitat would be maintained (*ARM 36.11429(1)(d)(ii)*). DNRC-managed home range habitat (excluding nest site habitat and primary use habitat) affected by the proposed harvest is located 0.5 miles from Noxon Reservoir, hence extensive use by eagles is not likely. Truck traffic associated with the timber harvest would elevate traffic levels on approximately 1.3 miles of roads located within bald eagle habitat. However, in the long-term, disturbance levels would be expected to decrease because open road density would be reduced from 4.1 miles/square mile to 3.8 miles/square mile following the closure of illegal roads. The proposed activities would occur in the project area for approximately 18 months over 3 years. Harvest and other forest management activities would be prohibited within nest site habitat and primary use habitat during the breeding season, unless the territory is documented as inactive (February 1 – August 15; *ARM 36.11429(1)(c)(i)*). Additionally, across the project area, at least 1 large snag and 1 large snag recruitment tree per acre (>21 inches dbh) would be retained (*ARM 36.11.411*). Thus, since: 1) proposed harvests would maintain the structure and ecological integrity of bald

eagle habitats, 2) some large trees or snags may be removed within bald eagle breeding habitats, but retention guidelines would apply (*ARM 36.11.411*) , 3) disturbance levels would increase initially due to increased logging traffic, but decrease post-harvest due to the closure of illegal roads, and 4) harvest would be prohibited in bald eagle nest site habitat and primary use habitat from February 1 – August 15 *(ARM 36.11429(1)(c)(i)*), minor direct and indirect effects to bald eagle eagles associated with nesting habitat quality or disturbance risk would be anticipated as a result of the Action Alternative.

Cumulative Effects of the No-Action Alternative on Bald Eagles

None of the proposed forest management activities would occur. Bald eagle habitat characteristics and disturbance levels would remain the same within the project area, but may change on other ownerships. Thus, since: 1) no change in bald eagle habitat characteristics would occur, and 2) no increased disturbance levels within the cumulative effects analysis area would occur, no cumulative effects to bald eagle eagles associated with nesting habitat quality or disturbance risk would be anticipated as a result of the No-Action Alternative.

Cumulative Effects of the Action Alternative on Bald Eagles

The proposed timber harvest would remove some important bald eagle habitat characteristics (i.e. large snags, large emergent trees) within bald eagle habitat (31 acres of bald eagle nest site habitat, 75 acres of bald eagle primary use habitat, and an additional 214 acres of bald eagle home range habitat). However, the overall structure and ecological integrity of nest site habitat and primary use habitat would be maintained (*ARM 36.11429(1)(c)(ii), ARM 36.11429(1)(d)(ii)*) and harvest between February 1 – August 15 would be prohibited in these habitats, unless the nest is documented as inactive (*ARM 36.11429(1)(c)(i)*). Additionally, across the project area, at least 1 large snag and 1 large snag recruitment tree per acre (>21 inches dbh) would be retained (*ARM 36.11.411*). The proposed harvest would be additive to proposed and ongoing harvests (see **ANALYSIS METHODS** section of the Introduction for a detailed description of projects). However, these projects are located in bald eagle home range habitat more than 0.6 miles from Noxon Reservoir, and are therefore not likely to receive extensive use by eagles. Truck traffic associated with the proposed timber harvest would increase traffic levels on approximately 3.7 miles of roads located within bald eagle breeding habitat for approximately 18 months over 3 years. If activities occur at the same time, increased traffic levels would be additive to the USFS Spring Gulch project (proposed). However, following the harvest, disturbance levels would decrease slightly following the closure of 0.3 miles of currently open roads. Thus, since: 1) proposed harvests would maintain the structure and ecological integrity of bald eagle habitats, 2) some large trees or snags may be removed within bald eagle breeding habitats, but retention guidelines would apply (*ARM 36.11.411*) , and 3) disturbance levels would increase initially due to increased logging traffic, but decrease post-harvest due to the closure of illegal roads, and 4) harvest would be prohibited in bald eagle nest site habitat and primary use habitat from February 1 – August 15 *(ARM 36.11429(1)(c)(i)*), minor cumulative effects to bald eagle eagles associated with nesting habitat quality or disturbance risk would be anticipated as a result of the Action Alternative.

FISHERS

Issue: **The proposed activities could reduce the availability and connectivity of preferred fisher habitats and increase human access, which could reduce habitat suitability and increase trapping mortality.**

Introduction

In the Rocky Mountains, fishers prefer late-successional moist coniferous forests (*Jones 1991*). Preferred fisher habitat typically contains large live trees, snags, and logs, which are used for resting and denning sites, and dense canopy cover, which is important for snow intercept (*Jones 1991*). Fishers generally avoid large openings in canopy cover, non-forested habitats, and shrub-seedling stands. The diet of fishers in Montana consists primarily of snowshoe hares, ungulate carrion, and small mammals (*Roy 1991*). Forest-management considerations for fisher involve providing upland and riparian resting and denning habitats and maintaining a network of travel corridors.

Analysis Area

The analysis area for direct and indirect effects is the project area (FIGURE W-1 –ANALYSIS AREAS). The analysis area for cumulative effects is the medium cumulative effects analysis area described in TABLE W-I – ANALYSIS AREAS (FIGURE W-1 –ANALYSIS AREAS). This scale includes enough area to approximate the home range of 2 male fishers (*Heinemeyer and Jones 1994*).

Analysis Methods

Analysis methods include field evaluations, aerial photograph interpretation, and Geographical Information System (GIS) analysis of travel corridors, preferred fisher cover type availability (*ARM 36.11.403(60)*), and fisher habitat structure. Preferred fisher cover type classifications considered in the analysis include: 1) upland fisher habitat, and 2) riparian fisher habitat. Classification of these two habitat types depends upon proximity to streams. Riparian fisher habitat is located within 100 feet of Class 1 streams or within 50 feet of Class 2 streams. The remaining preferred fisher cover type habitat is considered upland fisher habitat. Habitat structure considered appropriate for fisher use includes stands of sawtimber size class trees (≥9 inches dbh) with 40-70+% crown density. Potential fisher habitat (riparian, upland) on other ownerships was identified by examining mature forested habitat and proximity of mature forested habitat (100+ years in age, ≥40% cover) to perennial and intermittent streams. Factors considered in the analysis include: 1) the degree of harvesting, 2) availability and structure of preferred fisher habitats (upland, riparian), 3) landscape connectivity, and 4) human access.

Existing Conditions

Fisher

The project area contains 47 acres of preferred fisher cover type including riparian (3 acres) and upland habitats (44 acres). Of these 47 acres, 39 acres contain structure necessary for fisher use (sawtimber size class ≥ 9 inches dbh, 40-70+% crown density). Eight acres do not have adequate structure for fisher use including all of the riparian fisher habitat (3 acres) and 5 acres of upland fisher habitat. Open road density is high at 4.1 miles/square mile and total road density is 6.4 miles/square mile, thus trapping vulnerability is high. Connectivity of mature forested habitat in the project area is high. The majority of mature forested habitat (canopy cover ≥40%) is located in the northern portion of the project area and fisher travel through this area is likely. Riparian vegetation associated with Deep Creek also likely provides a travel corridor to additional mature forested canopy cover located on Lolo National Forest lands to the northeast of the project area (see *MATURE FORESTED HABITATS AND CONNECTIVITY* in the coarse-filter section for further information).

The medium cumulative effects analysis area contains approximately 8,480 acres (43.7% of analysis area) of mature forested habitat, which may provide suitable fisher habitat. Of these 8,480 acres, approximately 482 acres are located within 100 feet of perennial streams or within 50 feet of intermittent streams, potentially providing riparian fisher habitat. The remaining 10,928 acres in the cumulative effects analysis area consist of young stands, sparsely vegetated stands, and natural openings. In the vicinity of the project area, mature forested habitat patch size is variable (average: 180 acres, range: 3-4,164 acres) with large patches located on USFS lands to the north and northeast of the project area. Deep Creek and additional small streams may provide travel corridors between mature forested habitats. Open road density is low at 0.7miles/square mile and total road density is 1.2 miles/square mile, thus trapping vulnerability is low.

Environmental Effects

Direct and Indirect Effects of the No-Action Alternative on Fishers

None of the proposed forest management activities would occur. Fisher habitat availability, habitat structure, and landscape connectivity would remain the same. Thus, since: 1) no change in the availability or structure of preferred fisher habitats would occur, 2) no change in landscape connectivity would occur, and 3) no changes to human access would occur that would facilitate trapping, no direct or indirect effects to fisher associated with habitat suitability and trapping risk would be anticipated as a result of the No-Action Alternative.

Direct and Indirect Effects of the Action Alternative on Fishers

The proposed activities would affect 28 acres (59.8%) of the 47 acres of preferred fisher cover type present in the project area. None of the riparian fisher habitat would be affected. The proposed activities would change the structure of these habitats, reducing canopy cover from approximately 85% to 55-65% (proposed Harvest Units 2, 3, and 4). However, these stands would retain structure necessary for fisher use in areas where adequate structure currently exists (sawtimber size class, 40-70+% crown density). Habitat with inadequate structure would be expected to benefit from the proposed activities. Opening the stand would encourage growth of trees to an appropriate size class for fisher use. However, the availability of some important habitat characteristics (i.e., snags, coarse woody debris) could be reduced by harvest activities; although retention of deadwood would meet DNRC administrative rules (*ARM 36.11.411, ARM 26.11.414*). Riparian harvest would not occur and connectivity is not expected to be affected by the proposed activities. Approximately 0.2 miles of open roads are planned for construction; however, 0.3 miles of currently open roads would be closed under the proposal, reducing human access to the area from 4.1 miles/square mile to 3.8 miles/square mile. If present in the vicinity of the project area, fisher could be temporarily displaced by forest management activities for approximately 18 months. Thus, since: 1) no change in availability of preferred fisher habitats would occur, 2) structural changes to fisher habitat would occur, but snags and coarse woody debris would be retained (*ARM 36.11.411, ARM 26.11.414),* 3) landscape connectivity would not be altered, and 4) human access that could facilitate trapping would be reduced following illegal trail closure, negligible adverse direct and indirect effects to fisher associated with habitat suitability and trapping risk would be anticipated as a result of the Action Alternative.

Cumulative Effects of the No-Action Alternative on Fishers

None of the proposed forest management activities would occur. Fisher habitat availability, habitat structure, and landscape connectivity would remain the same within the project area, but may change on other ownerships. Thus, since: 1) no change in the availability or structure of preferred fisher habitats would occur, 2) no change in landscape connectivity would occur, and 3) no changes to human access would occur that would facilitate trapping, no direct or indirect effects to fisher associated with habitat suitability and trapping risk would be anticipated as a result of the No-Action Alternative.

Cumulative Effects of the Action Alternative on Fishers

The proposed activities would affect 28acres of the 8,480 acres of the potential fisher habitat present in the medium cumulative effects analysis area. However, the structural changes proposed for this habitat would not be substantial enough to preclude fisher use. Additionally, the harvest may encourage tree growth to an appropriate size class for fisher use in areas where adequate structure is not currently available. However, the availability of some important habitat characteristics (i.e. snags, coarse woody debris) could be reduced by harvest activities; although retention of deadwood would meet DNRC administrative rules (*ARM 36.11.411, ARM 26.11.414*). No riparian fisher habitat would be harvested and connectivity would not be expected to change. Any adverse affects to fisher would be additive to proposed and ongoing sales in the medium cumulative effects analysis area including the DNRC Deep 6 612 permit (18 acres), portions of the DNRC Harlow Dump timber sale (68 acres, ongoing), and the USFS Spring Gulch timber sale project (proposed) (see **ANALYSIS METHODS** section of the Introduction for a detailed description of projects). The USFS Spring Gulch Timber Sale Project (proposed) is expected to enhance fisher habitat. The DNRC Harlow Dump timber sale and the DNRC Deep 6 612 permit would remove canopy cover and are expected to have minor adverse effects on fisher. Additionally, none of the proposed and ongoing projects would increase open road density. The DNRC proposed Deep Blue sale would construct approximately 0.2 mile of open road, but would close 0.3 miles of currently open roads, slightly decreasing open road density and trapping risk. If present in the vicinity of the project area, fisher could be temporarily displaced by forest management activities for approximately 18 months. Thus, since: 1) no change in availability of preferred fisher habitats would occur, 2) structural changes to fisher habitat would occur, but snags and coarse woody debris would be retained (*ARM 36.11.411, ARM 26.11.414),* 3) landscape connectivity would not be altered, and 4) human access that could facilitate trapping would be slightly reduced following illegal trail closure, negligible adverse cumulative effects to fisher associated with habitat suitability and trapping risk would be anticipated as a result of the Action Alternative.

FLAMMULATED OWLS

Issue**: The proposed activities could alter the structure of flammulated owl preferred habitat types, which could reduce habitat suitability for flammulated owls**.

Introduction

Flammulated owls are small, migratory, insectivorous forest owls that inhabit old, open stands of warm-dry ponderosa pine and cool-dry Douglas-fir forests in the western United States (*McCallum 1994*). Flammulated owls are secondary cavity nesters, typically nesting in 12-25 inch dbh aspen, ponderosa pine, or Douglas-fir cavities excavated by pileated woodpeckers or northern flickers. Forest management considerations for flammulated owls include providing open, dry stands of ponderosa pine and Douglas-fir and retaining snags for nesting.

Analysis Area

The analysis area for direct and indirect effects is the project area (FIGURE W-I –ANALYSIS AREAS). The analysis area for cumulative effects is the medium cumulative effects analysis area described in TABLE W-I – ANALYSIS AREAS (FIGURE W-I –ANALYSIS AREAS). This scale represents an area large enough to support several pairs of flammulated owls (*McCallum 1994*).

Analysis Methods

Analysis methods include field evaluations, aerial photograph interpretation, and GIS analysis of available habitats. SLI data were used to identify preferred flammulated owl habitat types (*ARM 36.11.403(28)*). Canopy cover, trees/acre, and cover type were considered in analyses of flammulated owl habitat availability and structure. Factors considered in the analysis include: 1) the degree of harvesting, and 2) the availability and structure of flammulated owl preferred habitats.

Existing Conditions

Flammulated Owls

The project area contains 121 acres of marginal flammulated owl habitat. This habitat is composed primarily of Douglas-fir stands with some ponderosa pine, western larch, and grand fir with approximately 85% canopy cover. The canopy cover and stand density is higher than levels preferred by flammulated owls, but the cover type is appropriate. Snag density and coarse woody debris abundance is low (see *SNAGS AND COARSE WOODY DEBRIS* in the coarse-filter analysis section for additional information). The majority of snags sampled were small (10-13 inch dbh) Douglas-fir and grand fir. The Douglas-fir snags, could provide adequate snags for nesting cavities. Grand fir snags typically do not provide high-quality nesting habitat due to quick decay.

The medium cumulative effects analysis area contains approximately 8,479 acres (43.7%) of open forested conditions (≤40% canopy cover), which may provide suitable flammulated owl habitat. Open road density in the medium cumulative effects analysis area is relatively low (0.7miles/square mile) due in part to the proximity of the project area to a Lolo National Forest 20A land management area, in which road construction is allowed, but few roads are left open to the public (USFS 1986). Total road density is also low at 1.2 miles/square mile. Due to limited motorized access in this area, snag availability is likely adequate for flammulated owl nesting.

Environmental Effects

Direct and Indirect Effects of the No-Action Alternative on Flammulated Owls

None of the proposed forest management activities would occur. Flammulated owl habitat availability and structure would remain the same in the project area. Thus, since: 1) there would be no change in availability or structure of preferred flammulated owl habitats, no direct or indirect effects to flammulated owl habitat suitability would be anticipated as a result of the No-Action Alternative.

Direct and Indirect Effects of the Action Alternative on Flammulated Owls
Timber harvest would occur in 87 of the 121 acres (71.5%) of preferred flammulated owl cover types available in the project area. The proposed activities would open stands from 85% canopy cover to 55-65% canopy cover and reduce stem density to 35-45 trees/acre, improving suitability of stand structure for flammulated owls. Additionally, the proposed harvest would favor leaving ponderosa pine over Douglas-fir, moving the cover type towards ponderosa forest, which is preferable for flammulated owls (*ARM 36.11.437(b)*). Some snags could be removed by the proposed harvest, but at least 1 large snag and 1 large snag recruitment tree per acre (>21 inches dbh) would be retained (*ARM 36.11.411*). Flammulated owls are tolerant of human disturbance (*McCallum 1994*), however disturbance associated with harvesting could adversely affect flammulated owls for approximately 18 months over 3 years. The proposed activities would occur outside of the nesting season primarily in the fall and winter. Thus, since: 1) no change in the availability of preferred flammulated owl habitats would occur, and 2) changes in structure and cover type would increase flammulated owl habitat suitability, minor beneficial direct and indirect effects to flammulated owl habitat suitability would be anticipated as a result of the Action Alternative.

Cumulative Effects of the No-Action Alternative on Flammulated Owls
None of the proposed forest management activities would occur. Flammulated owl habitat availability and structure would remain the same in the project area, but may change on other ownerships. Thus, since: 1) no change in the availability or structure of preferred flammulated owl habitats would occur, no direct or indirect effects to flammulated owl habitat suitability would be anticipated as a result of the No-Action Alternative.

Cumulative Effects of the Action Alternative on Flammulated Owls
The proposed activities would occur in 87 acres of the 8,479 acres of potentially suitable flammulated owl habitat available in the medium cumulative effects analysis area. The proposed activities would open the stands from 85% to 55-65% canopy cover, reduce stem density to 35-45 trees/acre, and move the cover type from Douglas-fir toward ponderosa pine, increasing flammulated owl habitat suitability (*ARM 36.11.437(b)*). Additional activities occurring in the medium cumulative effects analysis include: the DNRC Deep 6 612 permit, the DNRC Harlow Dump timber sale (ongoing), and portions of the USFS Spring Gulch timber sale project (proposed). These projects would open up timber stands and are all expected to have minor beneficial effects on flammulated owls (see **ANALYSIS METHODS** section of the Introduction for a detailed description of projects). The proposed activities could disturb flammulated owls for 18 months (over 3 years) should they be present in the vicinity of the project area, but activities would occur outside of the nesting season. Thus, since: 1) no change in availability of preferred flammulated owl habitats would occur, 2) changes in structure and cover type would increase flammulated owl habitat suitability, minor beneficial cumulative effects to flammulated owl habitat suitability would be anticipated as a result of the Action Alternative.

GRAY WOLVES

Issue: **The proposed activities could disturb gray wolves and reduce winter range habitat quality for big game, which could displace gray wolves from denning and rendezvous sites and reduce prey availability.**

Introduction
Wolves are wide-ranging opportunistic carnivores that frequently take vulnerable ungulate prey (i.e. young individuals, older individuals, and individuals in poor condition). In general, wolf densities are positively correlated to prey densities (*Fuller et al. 1992*). Wolves prey primarily on white-tailed deer, and, to a lesser extent, elk and moose, in northwest Montana (*Kunkel et al. 1999*). However, some studies have shown that wolves may prey upon elk more frequently during certain portions of the year (particularly winter) or in areas where elk numbers are higher (*Arjo et al. 2002, Kunkel et al. 2004, Garrott et al. 2006*). Thus, reductions in big game populations and/or winter range productivity could be indirectly detrimental to wolf populations. Forest management considerations for wolves include restricting disturbance near den and rendezvous sites and promoting habitat characteristics necessary for healthy big game populations.

Analysis Area
The analysis area for direct and indirect effects is the project area (FIGURE W-1 –ANALYSIS AREAS). The analysis area for cumulative effects is the large cumulative effects analysis area described in TABLE W-1 –

ANALYSIS AREAS (FIGURE W-1 –ANALYSIS AREAS). This scale approximates an area large enough to support 1-2 wolf packs (*based upon DFWP wolf pack home range data, 2010*).

Analysis Methods

Analysis methods include field evaluation, aerial photograph interpretation, and GIS analysis of available habitats. Factors considered in the analysis include: 1) the degree of harvesting, 2) the location of any known den or rendezvous sites, and 3) big game winter range habitat characteristics.

Existing Conditions

Gray Wolves

The project area is located approximately 2.0 miles from the 2010 annual home range of the Silcox Pack. No wolf rendezvous sites, den sites, or wolf use of the project area has been documented (*K. Laudon, DFWP wolf management specialist, 2011, personal communication*); however, wolf use of the area could occur at any time. The analysis area is designated as elk (420 acres), mule deer (420 acres), and white-tailed deer (420 acres) winter range winter range by DFWP (*unpublished interagency map, 2008*) and winter browse was observed during field evaluations. The portion of the project area north of the Blue Slide Road provides important big game winter range due to high canopy cover (85%) and is likely to provide access to prey (see *BIG GAME* under sensitive species for further information), should wolves use the area.

The large cumulative effects analysis area contains 4,453 acres of the estimated home range of the Silcox Pack. The area is designated as elk, mule deer, and white-tailed deer winter range by DFWP (*unpublished interagency map, 2008*). The large cumulative effects analysis area contains approximately 10,568 acres (54.5% analysis area) of elk winter range, 11,206 acres (57.7% analysis area) of mule deer winter range, and 10,560 acres (54.6% analysis area) of white-tailed deer winter range. The analysis area contains large patches of mature forested habitat, which likely provide suitable winter range and access to prey (see *BIG GAME* under sensitive species for further information).

Environmental Effects

Direct and Indirect Effects of the No-Action Alternative on Gray Wolves

None of the proposed forest management activities would occur. Wolves would not be disturbed by forest management activities and existing big game winter range in the project area would remain intact. Thus, since: 1) no disturbance to wolf den or rendezvous sites would occur, and 2) no change in big game winter range habitat characteristics would occur, no direct or indirect effects to wolves associated with displacement or changes in prey availability would be anticipated as a result of the No-Action Alternative.

Direct and Indirect Effects of the Action Alternative on Gray Wolves

The proposed activities would reduce canopy cover in 320 acres of elk, mule deer, and white-tailed deer winter range. However, 55-65% canopy cover would be retained in areas currently providing snow intercept and wind velocity reduction and big game would be expected to continue using the area (see *BIG GAME* under sensitive species for further information). Additionally, there are no known wolf rendezvous or den sites in the project area. However, if documented in the vicinity of the project area, mechanized activities would be restricted within 1 mile of wolf dens (*ARM 33.11.430(1)(a)*) and 0.5 miles of wolf rendezvous sites (*ARM 33.11.430(1)(b)*). Wolf use of the area is possible, and if present, wolves could be displaced from the vicinity of the project area by forest management activities for approximately 18 months. Thus, since: 1) wolf den or rendezvous sites do not occur in the vicinity of the project area, but restrictions would apply if documentation occurs (*ARM 33.11.430(1)(a)(b)*), and 2) some canopy cover would be removed, but big game would be expected to continue using available winter range, negligible direct and indirect effects to wolves associated with displacement or changes in prey availability would be anticipated as a result of the Action Alternative.

Cumulative Effects of the No-Action Alternative on Gray Wolves

None of the proposed forest management activities would occur. Wolves would not be disturbed by forest management activities on DNRC lands. Big game winter range availability in the project area would not change, but may change on other ownerships. Thus, since: 1) no disturbance to wolf den or rendezvous sites would occur and 2) no change in big game winter range habitat characteristics would occur, no direct or indirect effects to wolves associated with displacement or changes in prey availability would be anticipated as a result of the No-Action Alternative.

Cumulative Effects of the Action Alternative on Gray Wolves
The proposed activities would reduce canopy cover in 320 acres of elk, mule deer, and white-tailed deer winter range, but due to canopy cover retention, big game would be expected to continue using the area. The alteration of canopy cover would be additive to proposed and ongoing activities occurring in the large cumulative effects analysis area including: the DNRC Deep 6 612 permit, the USFS Spring Gulch timber sale project (proposed), and the DNRC Harlow Dump timber sale (ongoing) (see **ANALYSIS METHODS** section of the Introduction for a detailed description of projects). The DRNC Harlow Dump sale is not expected to adversely affect wolves. The DNRC Deep 6 612 Permit and USFS Spring Gulch timber sale could displace individuals, but are not expected to cause a decrease in wolf populations. Additionally, any projects on other ownerships could disturb wolf den or rendezvous sites. There are no known rendezvous or den sites on DNRC lands in the large cumulative effects area. However, if documented in the vicinity of the project areas, mechanized activities would be restricted within 1 mile of wolf dens (*ARM 33.11.430(1)(a)*) and 0.5 miles of wolf rendezvous sites (*ARM 33.11.430(1)(b)*). Thus, since: 1) wolf den or rendezvous sites do not occur in the vicinity of the project area, but restrictions would apply if documentation occurs (*ARM 33.11.430(1)(a)(b)*), and 2) some canopy cover would be removed, but big game would be expected to continue using available winter range, negligible cumulative effects to wolves associated with displacement or changes in prey availability would be anticipated as a result of the Action Alternative.

PILEATED WOODPECKER

Issue: **The proposed activities could reduce tree density and alter the structure of mature forest stands, which could reduce habitat suitability for pileated woodpeckers.**

Introduction

Pileated woodpeckers require mature forest stands with large dead or defective trees for nesting and foraging. Cavities created by pileated woodpeckers are ecologically important and are often used in subsequent years by a variety of wildlife species for nesting and roosting. Pileated woodpeckers prefer to nest in ≥20 inch dbh western larch, ponderosa pine, cottonwood, or quaking aspen. The diet of the pileated woodpecker consists primarily of carpenter ants, which inhabit large downed logs, stumps, and snags. Forest management considerations for pileated woodpeckers include providing mature cottonwood and mixed conifer stands with large snags and coarse-woody debris.

Analysis Area

The analysis area for direct and indirect effects is the project area (FIGURE W-1 –ANALYSIS AREAS). The analysis area for cumulative effects is the medium cumulative effects analysis area described in TABLE W-1 –ANALYSIS AREAS (FIGURE W-1 –ANALYSIS AREAS). This scale provides a sufficient area to support multiple pairs of pileated woodpeckers (*Bull and Jackson 1995*).

Analysis Methods

Analysis methods include field evaluation, aerial photograph interpretation, and GIS analysis of available habitats. SLI data were used to identify preferred pileated woodpecker habitat (*ARM 36.11.403(58*)). Factors considered in the analysis include: 1) the degree of harvesting and 2) the availability and structure of pileated woodpecker preferred habitat types.

Existing Conditions

Pileated Woodpeckers
The project area contains 60 acres of pileated woodpecker habitat. This habitat consists primarily of mature Douglas-fir with some western larch, ponderosa pine, grand fir, and lodgepole pine. Canopy cover is high (approximately 85%), however few snags and low levels of coarse woody-debris exist for pileated woodpecker for foraging and nesting (see *SNAGS AND COARSE WOODY DEBRIS* in the coarse-filter analysis section for additional information).

The medium cumulative effects analysis area contains 8,480 acres (43.7% of analysis area) of mature forest (100+ years, ≥40% canopy cover), which may provide pileated woodpecker habitat. Due to limited motorized access to the medium cumulative effects analysis area, snag and coarse woody debris availability is likely adequate for pileated woodpecker nesting and foraging. Open road density in the medium cumulative effects

analysis area is relatively low (0.7 miles/square mile) due in part to the proximity of the project area to a Lolo National Forest 20A land management area in which road construction is allowed, but few roads are left open to the public (USFS 1986). Total road density is also low at 1.2 miles/square mile. Due to limited motorized access in this area, snag availability is likely adequate for pileated woodpecker nesting.

Environmental Effects

Direct and Indirect Effects of the No-Action Alternative on Pileated Woodpeckers

None of the proposed forest management activities would occur. Timber harvest would not occur in the 60 acres of DNRC-managed pileated woodpecker habitats that occur in the project area. Thus, since: 1) no change in the availability or structure of pileated woodpecker habitat would occur, no direct or indirect effects to pileated woodpecker habitat suitability would be anticipated as a result of the No-Action Alternative.

Direct and Indirect Effects of the Action Alternative on Pileated Woodpeckers

The proposed activities would occur in 48 acres (80.0%) of the 60 acres of pileated woodpecker habitat available in the project area. The proposed activities would open the stands from 85% to 55-65% canopy cover. The proposed harvest would favor retention of ponderosa pine, moving the cover type from Douglas-fir toward ponderosa pine, which would be beneficial to pileated woodpeckers (*ARM 36.11.449(1)(b)*). The availability of pileated woodpecker habitat would not change and use of the stand by woodpeckers would be expected to continue, but the proposed harvest could reduce the availability of snags and coarse-woody debris, reducing habitat quality. However, coarse-woody debris would be retained (*ARM 36.11.*414), and at least 1 large snag and 1 large snag recruitment tree per acre (>21 inches dbh) would be retained (*ARM 36.11.411*). If present in the vicinity of the project area during harvest, pileated woodpeckers could be displaced for approximately 18 months. However, the proposed activities would occur primarily in the fall and winter outside of the nesting season. Thus, since: 1) no change in the availability of preferred pileated woodpecker habitat types would occur, and 2) structural changes would occur, but mitigation would include retention of snags and coarse woody debris (*ARM 36.11.411, ARM 36.11.414*), minor adverse direct and indirect effects to pileated woodpecker habitat suitability would be anticipated as a result of the No-Action Alternative.

Cumulative Effects of the No-Action Alternative on Pileated Woodpeckers

None of the proposed forest management activities would occur. Pileated woodpecker habitat availability would remain the same in the project area, but may change on other ownerships in the medium cumulative effects analysis area. Thus, since no change in the availability or structure of pileated woodpecker habitat would occur, no cumulative effects to pileated woodpecker habitat suitability would be anticipated as a result of the No-Action Alternative.

Cumulative Effects of the Action Alternative on Pileated Woodpeckers

The proposed activities would occur in 48 acres of the 8,480 acres of mature forested habitat in the medium cumulative effects analysis area providing potential pileated woodpecker habitat. The proposed activities would open the stands from 85% to 55-65% canopy cover and move the cover type from Douglas-fir toward ponderosa pine. The availability of important pileated woodpecker habitat characteristics (i.e. snags and coarse woody debris) may be reduced, although retention of deadwood would meet DNRC administrative rules (*ARM 36.11.411, ARM 26.11.414*). The proposed activities would be additive to proposed and ongoing activities in the cumulative effects analysis area including: the DNRC Deep 6 612 permit, the DNRC Harlow Dump timber sale (ongoing), and portions of the USFS Spring Gulch timber sale project (proposed), which are all expected to have minor or no adverse effects on pileated woodpeckers (see **ANALYSIS METHODS** section of the Introduction for a detailed description of projects). If present in the vicinity of the proposed project area during harvest, pileated woodpeckers could be displaced for approximately 18 months. However, the proposed activities would occur primarily in the fall and winter outside of the nesting season. Thus, since: 1) no change in availability of preferred pileated woodpecker habitats would occur, and 2) structural changes would occur, but mitigation would include retention of snags and coarse woody debris, minor adverse cumulative effects to pileated woodpecker habitat suitability would be anticipated as a result of the Action Alternative.

BIG GAME WINTER RANGE

Issue: **The proposed activities could reduce cover, which could reduce the quality of big game winter range habitat.**

Introduction

Big game, including elk, mule deer, and white-tailed deer require areas with adequate amounts of cover and forage at lower elevations during winter. Effective big game winter range contains ample mid-story and overstory, which minimizes severe winter conditions by reducing wind velocity and providing snow intercept, enabling big game to move across the landscape and access forage with less energy expenditure. Forest management considerations for big game include providing adequate hiding cover and ample overstory, which ameliorate the effects of harsh weather conditions in winter.

Analysis Area

The analysis area for direct and indirect effects is the project area (FIGURE W-1 –ANALYSIS AREAS). The analysis area for cumulative effects is the medium cumulative effects analysis area described in TABLE W-1 – ANALYSIS AREAS (FIGURE W-1 –ANALYSIS AREAS). The medium cumulative effects analysis area is defined according to geographic features including watershed boundaries (ridgelines) and Noxon Reservoir, which would confine movements of local wintering big game animals in the vicinity of the project area.

Analysis Methods

Analysis methods include field evaluations, aerial photograph interpretation, and GIS analysis of available big game winter range (*unpublished interagency map, 2008*). The availability of mature forested habitat (100 plus years in age and ≥ 40% canopy cover) was used to assess the quality of big game winter range in the medium cumulative effects analysis area. Factors considered in the analysis include: 1) the degree of timber harvesting, 2) the availability and structure of big game winter range.

Existing Conditions

Big Game Winter Range

The project area is designated as elk (420 acres), mule deer (420 acres), and white-tailed deer (420 acres) winter range winter range by DFWP (*unpublished interagency map, 2008*). Approximately 155 acres (36.9% analysis area) of the project area contains mature, densely stocked Douglas-fir with some western larch, ponderosa pine, grand fir, and lodgepole pine (85% canopy cover). This habitat is located in the northern portion of the project area and provides good thermal protection for big game. Evidence of use by deer and elk (including winter browsing) was noted throughout this area during field visits.

The medium cumulative effects analysis area contains approximately 10,568 acres (54.5% analysis area) of elk winter range, 11,206 acres (57.7% analysis area) of mule deer winter range, and 10,560 acres (54.6% analysis area) of white-tailed deer winter range (*unpublished interagency map, 2008*). Approximately 8,480 acres (43.7% analysis area) of mature forested habitat (≥40% canopy cover) exists in the medium cumulative effects analysis area and likely provides good thermal protection for big game.

Environmental Effects

Direct and Indirect Effects of the No-Action Alternative on Big Game Winter Range

None of the proposed forest management activities would occur. Big game thermal cover available in the project area would not be affected. Mature forested habitat in the project area providing thermal cover would not be affected. Thus, since: 1) the structure of existing big game winter range would not change, no direct and indirect effects to big game winter range quality would be anticipated as a result of the No-Action Alternative.

Direct and Indirect Effects of the Action Alternative on Big Game Winter Range

Of the 420 acres of elk, mule deer, and white-tailed deer winter range available in the analysis area, 320acres (76.2%) would be affected by the proposed activities. Canopy cover would be reduced from 85% to 55-65% within 121 of the 155 acres of thermal cover located in the northern portion of the analysis area (proposed harvest units 2, 3,and 4; 18 of the remaining acres were harvested under the DNRC Deep 6 612 Permit). The proposed activities would reduce the capacity of big game winter range to provide snow intercept and to reduce

wind velocity; however, the area would retain adequate canopy cover to facilitate some continued use by big game. Additionally, clumps of trees approximately 50 feet in diameter would be retained to provide pockets of high quality thermal cover. The proposed activities would occur in the winter (August 16 – March 31), and if present in the vicinity of the project area, big game could be displaced for a total of approximately 18 months over 3 years. Thus, since: 1) the availability of big game winter range habitat would persist, 2) some canopy cover would be removed, reducing the quality of big game winter range on 121acres, and 3) displacement of big game would be temporary (approximately 18 months), minor adverse direct and indirect effects to big game winter range quality would be anticipated as a result of the Action Alternative.

Cumulative Effects of the No-Action Alternative on Big Game Winter Range
None of the proposed forest management activities would occur. Big game thermal cover would not be affected, but may change on other ownerships. Thus, since the structure of existing big game winter range would not change, no cumulative effects to big game winter range quality would be anticipated as a result of the No-Action Alternative.

Cumulative Effects of the Action Alternative on Big Game Winter Range
The proposed harvest would reduce canopy cover from 85% to 55-65% within 121 of the 8,480 acres of mature habitat available in the medium cumulative effects analysis area. Reductions in thermal cover would be additive to proposed and ongoing activities in the cumulative effects analysis area including: the DNRC Deep 6 612 permit, the USFS Spring Gulch timber sale project (proposed), and the DNRC Harlow Dump timber sale (ongoing) (see **ANALYSIS METHODS** section of the Introduction for a detailed description of projects). The DNRC projects are expected to have minor adverse effects to big game winter range due to reductions in thermal cover. The USFS Spring Gulch timber sale would change the cover/forage ratio, but would provide sufficient age classes needed for viable populations (*USFS 2011*). Thus, since: 1) the availability of big game winter range habitat in the project area would persist 2) some canopy cover would be removed, reducing the quality of big game winter range, and 3) displacement of big game would be temporary (approximately 18 months), minor cumulative effects to big game winter range quality would be anticipated as a result of the Action Alternative.

ELK SECURITY HABITAT

Issue: **The proposed activities could reduce visual screening and increase human access, which could reduce the availability of elk security habitat.**

Introduction

Elk security habitat provides hiding areas during hunting season by reducing visibility and accessibility in forested landscapes, reducing the likelihood that an animal will be observed and harvested (*Hillis et al. 1991*). Because the female segments of the elk populations are normally carefully regulated during hunting seasons, primary concerns are related to a substantial reduction of the male population and subsequent decrease in hunter opportunity. Forest management considerations for elk security habitat include providing adequate cover and restricting motorized access.

Analysis Area

The analysis area for direct and indirect effects is the project area (FIGURE W-1 –ANALYSIS AREAS). The analysis area for cumulative effects is the medium cumulative effects analysis area described in TABLE W-1 – ANALYSIS AREAS (FIGURE W-1 –ANALYSIS AREAS). The medium cumulative effects analysis area approximates an area large enough to support a local elk herd during the 6 week general big game season (*B. Sterling, DFWP biologist, personal communication, December 2011*).

Analysis Methods

Analysis methods include field evaluations, aerial photograph interpretation, and GIS analysis of available big game security habitat. Big game security habitat was defined as mature forested (≥40% canopy cover in overstory trees >9 inches dbh) habitat ≥250 acres located >0.5 miles from open roads (*Hillis et al. 1991*). Factors considered in the analysis include: 1) the degree of timber harvesting, 2) the availability and structure of big game security habitat, and 3) changes to open road and restricted road density.

Existing Conditions

Elk Security Habitat

The project area contains 155 acres of mature forested habitat with ample cover consisting of stands of Douglas-fir with some western larch, ponderosa pine, grand fir, and lodgepole pine. This habitat is located in the northern portion of the project area and provides good visual screening cover. However, the project area does not include any security habitat as defined by *Hillis et al. 1991* due to the proximity of the area to open roads. Open road density is 4.1 miles/square mile (total road density 6.4 miles/square mile). However, mature forested habitat available in the northern portion of the project area is connected to a large patch of security habitat located to the north of the project area on Kootenai National Forest Lands (FIGURE W-2 – SECURITY HABITAT; See *MATURE FORESTED HABITATS AND CONNECTIVITY* of the coarse filter section for additional information). This habitat may provide some visual screening that could reduce elk vulnerability during the hunting season, although it would be less effective than areas located >0.5 miles from open roads.

The medium cumulative effects analysis area contains approximately 8,480 acres (43.7% analysis area) of mature forested habitat (≥40% canopy cover) that likely provides good visual screening for elk security habitat. Of these 8,480 acres of mature forested habitat, 5,913 acres (30.5% of the cumulative effects analysis area) are located >0.5 miles from open roads and provide big game security habitat (*Hillis et al. 1991*) (FIGURE W-2 – SECURITY HABITAT). The majority of the security habitat is located in the vicinity of the project area with a few scattered patches of security habitat located in the northern portion of the medium cumulative effects analysis area. The remaining mature forested habitat (≤0.5 miles from open roads) may help lessen vulnerability of elk during hunting season, depending upon topography and the location of open roads. The availability of security habitat meets the 30% suggested for retention in order to reduce bull elk vulnerability (*Hillis et al. 1991*). Open road density in the analysis area is relatively low at approximately 0.7 miles/square mile and total road density is also low at 1.2 miles/square mile.

Environmental Effects

Direct and Indirect Effects of the No-Action Alternative on Elk Security Habitat

None of the proposed forest management activities would occur. Elk hiding cover and human access would not be affected. Thus, since: 1) the availability of big game security habitat would not change and 2) open and restricted road density would not change, no direct and indirect effects to elk security habitat availability would be anticipated as a result of the No-Action Alternative.

Direct and Indirect Effects of the Action Alternative on Elk Security Habitat

Big game security habitat defined according to *Hillis et al.* 1991 is not available in the project area due to the proximity of mature forest habitat to open roads; however, dense stands in the northern portion of the analysis area are likely provide valuable cover for elk during hunting season due to the proximity of this area to large existing patches of security habitat on neighboring ownerships. Canopy cover would be reduced in this area from 85% to 55-65% within 121acres of the 155 acres of mature forested habitat providing elk hiding cover (proposed harvest units 2, 3, and 4; 18 of the remaining acres were harvested under the DNRC Deep 6 612 Permit). The proposed activities would reduce the capacity of the stand to provide visual screening; however, shrubs and regenerating conifers would be retained throughout the project area to provide visual screening and security cover, especially near open roads. Approximately 0.2 miles of new open roads are planned for construction; however, 0.3 miles of currently open roads would be closed under the proposal, reducing open road density from 4.1 miles/square mile to 3.8 miles/square mile. Approximately 0.4 miles of restricted roads are planned for construction. The proposed activities would occur August 16 – March 31, and if present in the vicinity of the project area, big game could be displaced from security habitat for a total of approximately 18 months (over 3 years). Thus, since: 1) the availability of security habitat would persist, 2) some canopy cover would be removed, reducing the quality of existing elk hiding cover, and 3) open road density would decrease, no changes in the availability of habitat patches meeting the minimum requirements of Hillis et al. (1991) would be expected. However, minor adverse direct and indirect effects to elk associated with minor potential increases in elk vulnerability due to anticipated reductions in visual screening and temporary increases in motorized disturbance would be expected.

Cumulative Effects of the No-Action Alternative on Elk Security Habitat

None of the proposed forest management activities would occur. Elk hiding cover and human access would not be affected on DNRC lands, but could change on other ownerships. Thus, since: 1) the availability of big game

security habitat would not change, and 2) open and restricted road density would not change, no cumulative effects to elk security habitat availability would be anticipated as a result of the No-Action Alternative.

Cumulative Effects of the Action Alternative on Elk Security Habitat
The proposed harvest would reduce canopy cover from 85% to 55-65% within 121 acres of the 8,480 acres of mature forested habitat providing elk hiding cover in the medium cumulative effects analysis area. The proposed reduction in hiding cover would be additive to proposed and ongoing activities in the medium cumulative effects analysis area including: the DNRC Deep 6 612 permit, the USFS Spring Gulch timber sale project (proposed), and the DNRC Harlow Dump timber sale (ongoing) (see **ANALYSIS METHODS** section of the Introduction for a detailed description of projects). The DNRC projects are expected to have minor effects to big game due to reductions in canopy cover. The USFS Spring Gulch timber sale may temporarily reduce the availability of security habitat. Open road density is expected to decrease slightly in the medium cumulative effects analysis area. Approximately 0.2 miles of open roads would be constructed under the proposed DNRC Deep Blue timber sale; however, 0.3 miles of currently open roads would be closed. Approximately 0.4 miles of restricted roads are planned for construction under the DNRC Deep Blue timber sale. Additionally, the medium cumulative effects timber sales listed above (proposed an ongoing) do not include any additional open road construction. The proposed activities would occur August 16 – March 31, and if present in the vicinity of the project area, big game could be displaced from security habitat for a total of approximately 18 months (over 3 years). Thus, since: 1) the availability of security habitat would persist, 2) some canopy cover would be removed, reducing the quality and availability of elk hiding cover, and 3) open road density would decrease slightly following the closure of illegal roads, minor cumulative effects to elk security habitat availability would be anticipated as a result of the Action Alternative.

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FIGURE W-1 –ANALYSIS AREAS. Wildlife analysis areas for the proposed DNRC Deep Blue timber sale.

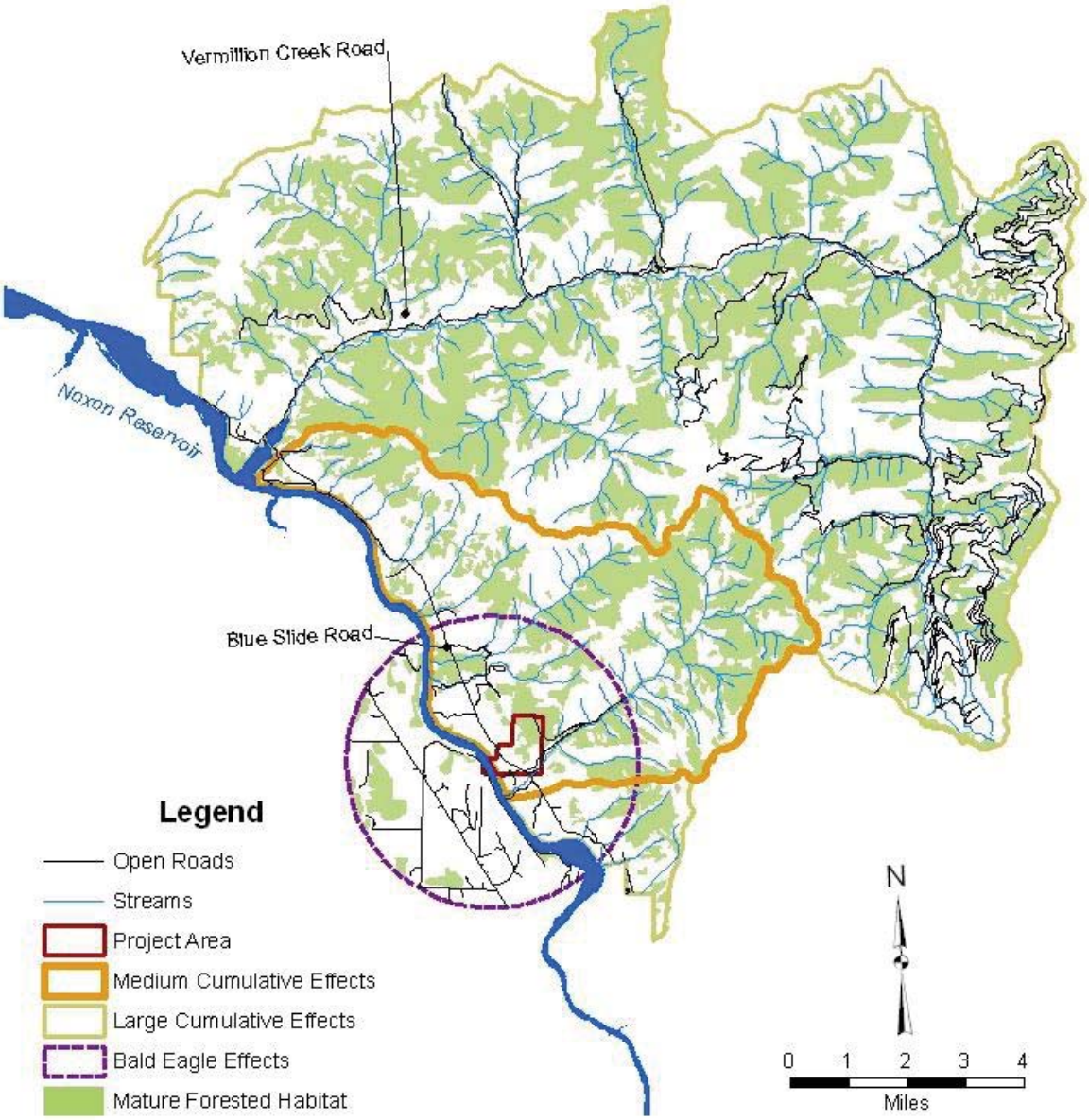
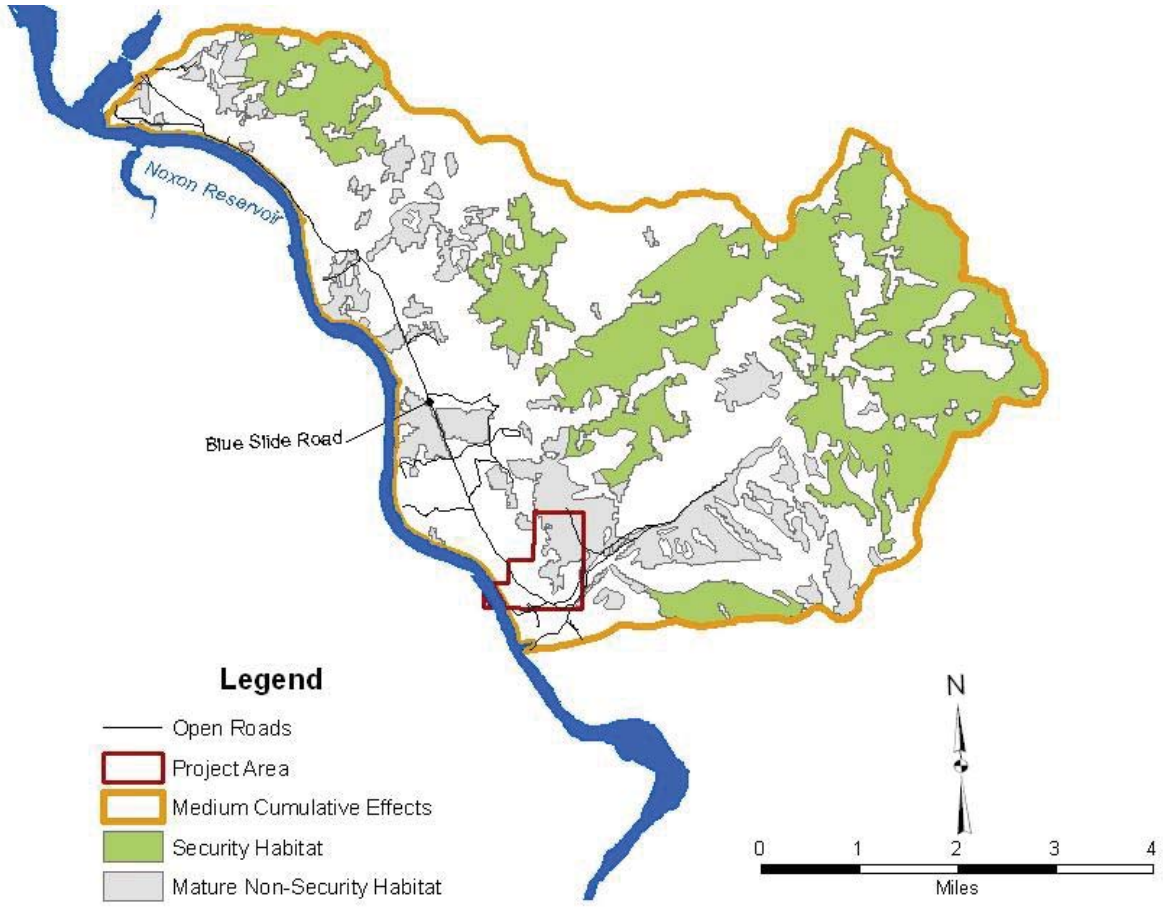


FIGURE W-2 –SECURITY HABITAT. Availability of elk security habitat. Mature forested habitat that does not meet the definition of security habitat due to the proximity of open roads is shown in gray.



Attachment III

Prescriptions

Proposed Deep Blue Timber Sale Harvest Unit Prescriptions

Harvest Unit: 1 (see Harvest Map pg. 16) **Harvest Unit Acres:** 118 acres

Elevation: 2500 ft. **Slope:** 0-30 % **Aspect:** Flat to Southwesterly

Habitat Type: ABGR/LIBO

Current Cover Type: western larch/Douglas fir, ponderosa pine, Douglas fir

Desired Future Condition: Western larch/Douglas fir, ponderosa pine

Soil Type: Lionwood, Bonnash

Description of Existing Stand: This unit is located mostly in the southwest quarter of State land in Section 16, Township 23 North, Range 30 West and is bisected by the Blue Slide County Road. The unit is comprised of portions of four identified stands in the Stand Level Inventory. The topography is mostly flat with slopes ranging from 0-30%. Following the 1910 fire, a dense stand of mixed species regenerated on this site. The majority of the timber is now 90-100 years old and is an essentially even-aged, single story stand comprised of a fairly even mix of ponderosa pine, western larch, Douglas fir and grand fir. Average tree diameter in the overstory is 15"dbh and averages 90 feet in height. Regeneration averages 15 to 20 years old, averages 3-6" in dbh and is limited to small groupings of grand fir and Douglas fir. Past logging activities have left a fairly open canopy from 20-50%. A few over mature, large diameter (>25" dbh) Douglas fir and ponderosa pine that survived the fire are scattered throughout the unit.
Mountain pine beetle (*Dendroctunus ponderosae*) activity is evident in the ponderosa pine in endemic proportions. While mistletoe occurs occasionally in the western larch it is prevalent in the Douglas-fir overstory along with root and stem rot diseases. Surface fuel loading of down material ranges from 0-5 tons per acre.

Treatment Objectives:

- Remove unhealthy, diseased trees, as well as those with poor vigor, from the overstory to promote long-term forest health.
- Thin intermediate and understory components of stand to enhance growth characteristics and reduce fuel loading.
- Harvest all merchantable grand fir.
- Promote natural ponderosa pine and western larch regeneration in areas where Douglas-fir is becoming dominant component in the stand.

Prescribed Treatment:

- Selective thinning, spacing out healthy trees with good crown and bark characteristics on a variable spacing leaving 35-45 TPA. Favor leaving ponderosa pine and western larch, then Douglas-fir in that order. Remove all merchantable lodgepole and grand fir.
- Reduce 50% canopy cover to 30-35% canopy cover.
- Create openings of 100' on at least two sides of existing clumps or isolated individual ponderosa pine and western larch overstory trees in the areas where Douglas –fir is the predominant species.
- Retain at least two snags per acres >21" DBH and two snag recruits per acre to remain standing if they are not a safety hazard.

Harvest Method:

- Tractor logging with conventional, mechanical, or cut-to-length operations are applicable to this unit.
- Trees marked to cut.

Hazard Reduction:

- Pile and burn at landings following harvest.
- High hazard cleanup due to the proximity of residential areas. Minimize slash retention within 1000 ft of homes.
- Slash would be lopped and /or trampled to a depth of 18” or less. In openings where ponderosa pine regeneration is a primary goal, slash would be spot piled and burned. Jackpot burn open areas during pile burning operations.
- Machine pile and burn all slash in excess of retention requirements of 5 to 10 tons per acre.

Regeneration/Site Preparation:

- Monitor for precommercial thinning needs 5 years after the harvest.
- Plant western larch, Douglas fir and grand fir seedlings within one year of harvest. Require scalping along with tree planting to provide planting spots. Monitor success of natural and planted regeneration and replant if necessary.

Anticipated Future Treatments:

- Stand conditions would be monitored for future salvage opportunities related to insect and disease outbreaks, severe weather events, fire or other unanticipated circumstances on a case-by-case basis.
- This stand would be evaluated for regeneration, planting needs and possible precommercial thinning opportunities as the stand progresses in age.

Harvest Unit: 2 (see Harvest Map pg. 16) **Harvest Unit Acres:** 46 acres

Elevation: 2800 ft. **Slope:** 0-35 % **Aspect:** Southwest

Habitat Type: PSME/PHME

Current Cover Type: Douglas fir

Desired Future Condition: ponderosa pine, Douglas fir

Soil Type: Mitten

Description of Existing Stand: This unit is located in the northeast quarter of Section 16, Township 23 North, Range 30 West, south of Road 2241. The unit is comprised of portions of two identified stands in the Stand Level Inventory. The topography is sloped ranging from 0-35 %. Following the 1910 fire, a dense stand of mixed species, predominately Douglas fir with scattered ponderosa pine regenerated on this site. The majority of the timber is now 95-100 years old and with the exception of a few pockets regeneration has created an essentially even-aged stand, single story stand. The overstory is comprised mostly of evenly distributed Douglas fir and forms an 85-95% closed canopy. Average tree diameter in the overstory is 15"dbh and averages 75 feet in height. A few over mature, large diameter (>25"dbh) Douglas fir, western larch and ponderosa pine that survived the fire are scattered throughout the unit. Regeneration averages 15 to 20 years old, averages 3-6" in dbh and is limited to small groupings of grand fir and Douglas fir.
Mountain pine beetle (*Dendroctunus ponderosae*) activity is evident in the ponderosa pine in endemic proportions. While mistletoe occurs occasionally in the western larch it is prevalent in the Douglas-fir overstory along with root and stem rot diseases. Surface fuel loading of down material ranges from 15-20 tons per acre.

Treatment Objectives:

- Remove unhealthy, diseased trees, as well as those with poor vigor, from the overstory to promote long-term forest health.
- Thin overstory components of stand to enhance growth characteristics.
- Promote natural ponderosa pine and western larch regeneration in areas where Douglas-fir is becoming dominant component in the stand.

Prescribed Treatment:

- Shelterwood harvest, spacing out healthy trees with good crown and bark characteristics on a variable spacing leaving 35-40 TPA. Favor leaving ponderosa pine and western larch, then Douglas-fir in that order. Remove all merchantable lodgepole and grand fir.
- Reduce 85% canopy cover to 65% canopy cover.
- Look for opportunities to mark trees to leave in "clumps" to retain pockets of trees, preferably Douglas fir, for canopy cover of 50 foot diameter for thermal cover and big game habitat.
- Retain at least two snags per acres >14" DBH and two snag recruits per acre to remain standing if they are not a safety hazard.

Harvest Method:

- Tractor logging with conventional, mechanical, or cut-to-length operations are applicable to this unit.
- Trees marked to leave.

Hazard Reduction:

- Pile and burn at landings following harvest.
- Slash would be lopped and /or trampled to a depth of 18" or less. In openings where ponderosa pine regeneration is a primary goal, slash would be spot piled and burned. Jackpot burn open areas during pile burning operations.

- High hazard cleanup due to the proximity of residential areas. Minimize slash retention within 1000 ft of homes
- Machine pile and burn all slash in excess of retention requirements of 5 to 10 tons per acre.

Regeneration/Site Preparation:

- Regeneration is not a primary objective for this stand. Treatment would leave stand adequately stocked.
- These acres would be monitored for natural regeneration three years after harvest completion, and if necessary, seedlings would be ordered.

Anticipated Future Treatments:

- Stand conditions would be monitored for future salvage opportunities related to insect and disease outbreaks, severe weather events, fire or other unanticipated circumstances on a case-by-case basis.
- This stand would be evaluated for regeneration, planting needs and possible precommercial thinning opportunities as the stand progresses in age.
- Look for opportunity to remove overstory in 25 years.

Harvest Unit: 3 (see Harvest Map pg. 16) **Harvest Unit Acres:** 145 acres

Elevation: 2600 ft. **Slope:** 0-10 % **Aspect:** Flat to Southwesterly

Habitat Type: ABGR/CLUN, TSHE/CLUN

Current Cover Type: Douglas fir, western larch/Douglas fir, ponderosa pine

Desired Future Condition: western larch/Douglas fir, ponderosa pine

Soil Type: Lionwood

Description of Existing Stand: This unit is located mostly in the middle of Section 16, Township 23 North, Range 30 West and north of the Blue Slide Road. The unit is comprised of portions of five identified stands in the Stand Level Inventory. The topography is mostly flat with slopes ranging from 0-10%. Following the 1910 fire, a dense stand of mixed species regenerated on this site. The majority of the timber is now 80-95 years old and has created an essentially even-aged stand, single story stand. Overstory trees are relatively evenly distributed and form a closed canopy. Average tree diameter is 14"dbh and averages 70 feet in height. A few over mature Douglas fir and western larch that survived the fire are scattered throughout the section. Mountain pine beetle (*Dendroctunus ponderosae*) activity is evident in the ponderosa pine in endemic proportions. While mistletoe occurs occasionally in the western larch it is prevalent in the Douglas-fir overstory along with root and stem rot diseases. Regeneration occurs mostly in pockets where past logging has opened the canopy. Regeneration ranges from 3-8" dbh and is a mix of grand fir, Douglas fir, ponderosa pine and western larch. Height of regeneration varies from 3 feet to 20 feet. Surface fuel loading of down material ranges from 0-5 tons per acre.

Treatment Objectives:

- Remove unhealthy, diseased trees, as well as those with poor vigor, from the overstory to promote long-term forest health.
- Thin intermediate and understory components of stand to enhance growth characteristics and reduce fuel loading.
- Promote natural ponderosa pine and western larch regeneration in areas where Douglas-fir is becoming dominant component in the stand.

Prescribed Treatment:

- Shelterwood harvest spacing out healthy trees with good crown and bark characteristics on a variable spacing leaving 35-45 TPA. Favor leaving ponderosa pine and western larch, then Douglas-fir in that order. Remove all merchantable lodgepole and grand fir.
- Reduce 85% canopy cover to 55-65% canopy cover.
- Protect established regeneration from logging and slashing damage.
- Look for opportunities to mark trees to leave in "clumps" to retain pockets of trees, preferably Douglas fir, for canopy cover of 50 foot diameter for thermal cover and big game habitat.
- Retain at least two snags per acres >14" DBH and two snag recruits per acre to remain standing if they are not a safety hazard.

Harvest Method:

- Tractor logging with conventional, mechanical, or cut-to-length operations are applicable to this unit.
- Trees marked to leave.

Hazard Reduction:

- Pile and burn at landings following harvest.

- Slash would be lopped and /or trampled to a depth of 18” or less. In openings where ponderosa pine regeneration is a primary goal, slash would be spot piled and burned. Jackpot burn open areas during pile burning operations.
- High hazard cleanup due to the proximity of residential areas. Minimize slash retention within 1000 ft of homes
- Machine pile and burn all slash in excess of retention requirements of 5 to 10 tons per acre.

Regeneration/Site Preparation:

- Regeneration is not a primary objective for this stand. Treatment would leave stand adequately stocked.
- These acres would be monitored for natural regeneration three years after harvest completion, and if necessary, seedlings would be ordered.

Anticipated Future Treatments:

- Stand conditions would be monitored for future salvage opportunities related to insect and disease outbreaks, severe weather events, fire or other unanticipated circumstances on a case-by-case basis.
- This stand would be evaluated for regeneration, planting needs and possible precommercial thinning opportunities as the stand progresses in age.
- Look for opportunity to remove overstory in 25 years.

Harvest Unit: 4 (see Harvest Map pg. 16) **Harvest Unit Acres:** 12 acres

Elevation: 2800 ft. **Slope:** 35-60 % **Aspect:** Southwesterly

Habitat Type: PSME/PHMA

Current Cover Type: Douglas fir

Desired Future Condition: ponderosa pine

Soil Type: Tevis

Description of Existing Stand: This unit is located in the northwest quarter of the northeast quarter in Section 16, Township 23 North, Range 30 West. The unit is comprised of portions of two identified stands in the Stand Level Inventory. The topography is steep slopes ranging from 35-60% slopes. Following the 1910 fire, a dense stand of Douglas fir regenerated on this site. The majority of the timber is now 80-95 years old and has created an essentially even-aged stand, single story stand consisted mainly of Douglas fir with a few scattered ponderosa pine. Average tree diameter in the overstory is 15"dbh and averages 80 feet in height. Overstory trees are evenly distributed and form a relatively, 85-95%, closed canopy. Other than a few small pockets of suppressed grand fir, regeneration is nearly non-existent in this stand. Mistletoe is prevalent in the Douglas-fir overstory along with root and stem rot diseases. Surface fuel loading of down material ranges from 5-10 tons per acre.

Treatment Objectives:

- Remove unhealthy, diseased trees, as well as those with poor vigor, from the overstory to promote long-term forest health.
- Thin intermediate and understory components of stand to enhance growth characteristics and reduce fuel loading.
- Promote natural ponderosa pine and western larch regeneration in areas where Douglas-fir is becoming dominant component in the stand.

Prescribed Treatment:

- Shelterwood harvest spacing out healthy trees with good crown and bark characteristics on a variable spacing leaving 25-35 TPA. Favor leaving ponderosa pine and western larch, then Douglas-fir in that order. Remove all merchantable lodgepole and grand fir.
- Slash logging damaged submerchantable trees
- Retain at least two snags per acres >14" DBH and two snag recruits per acre to remain standing if they are not a safety hazard.

Harvest Method:

- Cable logging is applicable for this unit.
- High hazard cleanup due to the proximity of residential areas. Minimize slash retention within 1000 ft of homes
- Trees marked to leave.

Hazard Reduction:

- Pile and burn at landings following harvest.
- Jackpot burn open areas during pile burning operations.
- Machine pile and burn all slash in excess of retention requirements of 5 to 10 tons per acre.
- High hazard cleanup due to the proximity of residential areas. Minimize slash retention within 1000 ft of homes.

Regeneration/Site Preparation:

- Regeneration is not a primary objective for this stand. Treatment would leave stand adequately stocked.
- These acres would be monitored for natural regeneration three years after harvest completion, and if necessary, seedlings would be ordered.

Anticipated Future Treatments:

- Stand conditions would be monitored for future salvage opportunities related to insect and disease outbreaks, severe weather events, fire or other unanticipated circumstances on a case-by-case basis.
- This stand would be evaluated for regeneration, planting needs and possible precommercial thinning opportunities as the stand progresses in age.
- Look for opportunity to remove overstory in 25 years.

Attachment IV

Mitigations

Mitigation Measures

Roads: A transportation system minimizing road miles and meeting all BMP's has been designed by DNRC. Roads constructed in association with this project total approximately .5 miles, and would remain in place following the completion of this project. After activities have been completed, the roads would be grass seeded and roads that are currently closed to the public would remain closed. There would be maintenance and minor improvements totaling 2.5 miles, involving road surface drainage and opening roads for safe hauling traffic. If the Cost Share Agreement is implemented before the end of the sale the 68000 extension road may be utilized as part of the haul route. The USDA Forest Service would assume the decision of restrictions on roads involved in the cost share agreement. Upon completion of roadwork, all haul roads would meet Best Management Practices (BMP's) standards.

Wildlife Mitigations:

- Cease all operations if a threatened or endangered species is encountered. Consult a DNRC biologist and develop additional mitigations that are consistent with the administrative rules for managing threatened and endangered species (*ARM 36.11.428* through *36.11.435*).
- Manage for snags, snag recruits, and coarse woody debris, particularly favoring ponderosa pine, western larch and Douglas-fir. Consider broken top snags >20 feet tall priority candidates for snag retention (*ARM 36.11.439(1)(b)*).
- Effectively close roads and trails to the extent possible after the proposed activities to reduce the potential for unauthorized motor vehicle use and/or loss of snags to firewood gathering.
- Prohibit contractors and purchasers conducting contract operations from carrying firearms while operating on restricted roads *(ARM 36.11.432(1)(m)*).
- Prohibit harvest and other forest management activities between February 1 and August 15 in bald eagle nest site habitat and primary use habitat during the breeding season, unless the territory is documented as inactive (*ARM 36.11429(1)(c)(i)*).
- Use a combination of topography, group retention, and roadside vegetation to reduce sight distances within harvest units where feasible. Consider retention of clumps of trees approximately 50 feet in diameter to provide pockets of thermal cover.
- Prohibit harvest and other motorized activities in the spring period (April 1- June 15) as per GB-NR3, GB-CY3 and Table 2-7 (*DNRC HCP FEIS Vol II. pp. 2-11, 2-43, 2-44*).

Soils: Limit equipment operations to periods when soils are relatively dry, (less than 20% soil moisture content), frozen or snow covered to minimize soil compaction and rutting, and maintain drainage features. Check soil moisture conditions prior to equipment start-up. On ground skidding units, the logger and sale administrator would agree to a general skidding plan prior to equipment operations. Skid trail planning would identify which main trails to use, and what additional trails may be needed. Trails that do not comply with BMP's (i.e. draw bottom trails) would not be used and would be closed with additional drainage installed where needed or grass seeded to stabilize the site and control erosion. Tractor skidding would be limited to slopes less than 45%.

Slash Disposal: Limit disturbance and scarification to 30-40% of harvest units. No dozer piling on slopes over 35%: no excavator piling on slopes over 40% unless the operation **can be completed without excessive erosion**. Consider lop and scatter or jackpot burning on steeper slopes. Accept disturbance incurred during skidding operations to provide for a portion of the scarification for regeneration. Retain 10-15 tons/acre large woody debris and a majority of all fine litter feasible following harvest (ARM 36.11.410 and 36.11.414). High hazard cleanup area, no excess slash within 1000' of private property. *These measures would be specified in the timber Sale Contract and would be monitored by the Forest Officer.*

Noxious Weeds: Roads and skid trail approaches would be seeded and spot treated with chemicals following construction and project completion. Prior to entering site, off-road logging equipment would be cleaned and inspected through the timber sale contact to avoid seed migration. Roads would be closed following the sale to avoid migration of weed seed into the area. Post harvest, the area would be included in the Plains Unit's integrated weed management program. Biological, mechanical and chemical methods would be used to control noxious weeds.

Stand growth and Vigor: A concern was brought up regarding the growth and vigor potential of the stands in this project area. Silvicultural prescriptions are designed to maintain and improve stand growth vigor, while maintaining DNRC's commitments to managing for a biologically diverse landscape.

Visual Impacts/Aesthetic Values: A buffer strip retaining a combination of regeneration and large diameter trees along the main roads should minimize the visual impacts. The end result should be aesthetically acceptable for most people, as the resulting stands will still be denser and contain larger trees than does most of the surrounding ownership.

Attachment V

Consultants and References

Preparers

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Consultants

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