WINDY PASS SALVAGE

ENVIRONMENTAL ASSESSMENT

PREPARED BY THE KALISPELL UNIT,
NORTHWESTERN LAND OFFICE

MONTANA DEPARTMENT OF NATURAL RESOURCES
AND CONSERVATION

OCTOBER 2012

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CHECKLIST ENVIRONMENTAL ASSESSMENT

Project Name:	Windy Pass Salvage
Proposed:	
Implementation Date:	December 2012
Proponent:	DNRC
Location:	Section 36, T23N, R23W; Windy Pass
County:	Lake

I. TYPE AND PURPOSE OF ACTION

DNRC, Kalispell Unit, is proposing to salvage harvest approximately 922 MBF of timber from 156 acres burned during the West Garceau fire of August 2012.

The purpose of the timber sale is:

1) To generate revenue for the common school trust (C.S.) by timely salvaging burned timber before it loses economic value as directed in MCA 77-5-207.
2) Sanitize the stand by removing trees infected with dwarf mistletoe.
3) Reduce competition for PP & WL in densely stocked patches of timber that was only scorched in the fire.
4) Promote desired future conditions by planting ponderosa pine seedlings.

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.

A scoping letter was sent to adjacent landowners and interested parties on August 29, 2012. Eight (8) letters and seventeen (17) emails were sent. Two public responses and one agency response were received. Issues raised by the public included rehabilitation plans associated with the fire and the loss of fencing and placement of a cattle guard on the State section.

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.

The 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.

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.

1. No Action- No salvage/sanitation harvesting would occur.

2. Action- Timber salvage/sanitation harvest on 156 acres and would remove trees killed in the West Garceau fire, trees infected with dwarf mistletoe, and co-dominant and intermediate trees that are encroaching upon ponderosa pine and western larch. In addition, 22,000 seedlings would be planted on approximately 102 acres across the 3 harvest units.

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.

Please refer to the Soils Analysis in Attachment II, pages 27-31for a detailed analysis.

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.

The project is on a dry slope above the headwaters of Irvine Creek near Big Arm, Montana. None of the proposed harvesting is located within 300 feet of any stream channel or surface water. Because the salvage harvest units are located away from any surface water and the scale of the project is small, only a very low risk of impacts would exist.

No municipal water supply is found within 3 miles of the project.

Identified harvest areas are located well away from streams. The designated haul route from the harvest units to US Highway 93 uses established moderate-standard forest roads and county roads.

Per ARM 36.11.423 (1) (a-b), DNRC has completed a coarse filter screening for cumulative effects, which is located in the project file. Due to the small scale of this project in relation to the watershed size, the risk of additional cumulative impacts would be very low and likely immeasurable. Therefore, cumulative impacts would remain acceptable for this watershed.

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.

This area is currently managed under the Montana Airshed Group and lies within Airshed 2. The airshed group monitors weather conditions and manages open burning restrictions in the airshed to prevent or limit burning operations during poor dispersion and ventilation conditions.

No Action: Air quality would not change from existing condition. No slash burning associated with timber harvesting would occur.

Action Alternative: Timber harvesting has the potential to reduce air quality in the project area. Slash burning would be done in cooperation with the Montana Airshed Group. This would provide for burning when conditions are acceptable in terms of ventilation and dispersion.

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.

Please refer to the Vegetation Analysis in Attachment II, pages 12-15, for a detailed analysis.

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.

Please refer to the Wildlife Analysis in Attachment II, pages 16-26, for a detailed analysis.

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.

No Canada lynx habitat occurs in the project area and the project is outside grizzly bear recovery and non-recovery occupied habitat.

Please refer to the Wildlife Analysis in Attachment II, pages 16-26, for a detailed analysis.

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

The Windy Pass section was inventoried by the DNRC archaeologist in 1995 as part of the DNRC White Earth timber sale. No historical, archaeological or paleontological resources were found. No direct, indirect, or cumulative effects to historical, archaeological, or paleontological resources are expected.

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 project area is located in a rural area with a few scattered ranches. The project area is part of a larger area that was burned in the West Garceau fire. Silvicultural prescriptions would harvest trees killed in the fire and will not change the site appearance from what the fire has already done to the surrounding landscape.

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 limited resources were identified. No direct, indirect, or cumulative effects are expected with implementation of 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.

The Windy Pass section is managed as part of the grazing lease program on the Kalispell Unit. No cumulative effects are anticipated.

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.

No health and safety risks were identified. No direct, indirect, or cumulative effects to human health are anticipated with implementation of either alternative.

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

No effects to Industrial, commercial, and agricultural activities are anticipated with implementation of either alternative.

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.

People are currently employed in the wood products industry in the region. According to Montana Bureau of Business and Economic Research, approximately 10 jobs are supported for one year for every 1 MMBF that is harvested. For this project, that equates to approximately 9 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. Do to the small size of the project, 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

There would be no measurable cumulative effects related to demand for government services due to the relatively small size of the project. Short-term impacts to traffic would not change patterns but would be considered normal to the local community and industrial base.

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 ROD for the 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 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 ROD for the Montana DNRC Forested State Trust Lands HCP. Approval of the ROD was followed by the issuance of an Incidental Take Permit (Permit) by the USFWS. The HCP is a required component of an application for a Permit which may be issued by the USFWS 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 project area is accessed by an open, county road and is generally used for hunting purposes. No direct, indirect, or cumulative effects to recreational activities are anticipated with implementation of either 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.

Due to the relatively small size of the project, no direct, indirect, or cumulative effects to population and housing is anticipated.

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

Due to the relatively small size and short-term length of the project, no direct, indirect, or cumulative effects to social structures and mores is anticipated.

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

No impacts to cultural uniqueness and diversity are anticipated.

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 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 timber.

The effect of the proposed project will produce an estimated return of $57,000 for the Common Schools (CS) Trust and an additional $23,000 in Forest Improvement fees. The no-action alternative would not produce revenue for the Common Schools (CS) Trust.

A Checklist Prepared By:	**Name:**	Brent Kallander	**Date:**	10/29/2012
	Title:	Forester		

V. FINDING

25. ALTERNATIVE SELECTED:

The Montana Department of Natural Resources and Conservation has completed the environmental assessment (EA) for the proposed Windy Pass Fire Salvage on State School Trust Lands located in Section 36, T23N, R23W. After a thorough review of the EA, public comments, the project file, Department policies, standards, and guidelines, I have made the following decisions concerning this project:

The alternatives proposed for consideration in this EA were the No-Action and Action Alternatives. The Action Alternative would allow for the harvest of approximately 922 MBF of timber from 156 acres and planting of 22,000 seedlings. Information contained in the EA indicates that issues associated with vegetation, water resources and soils, future grazing (including fencing), and wildlife (including snag and woody debris recruitment) are identified and have been resolved or mitigated by the design of the project, or those mitigations would be specific contractual requirements of the project.

The Action Alternative has been selected for the following reasons:

- The Action Alternative meets the Project Purpose and Need listed under section I. of the EA;
- The proposed use is consistent with State and local policies, laws, and regulations;
- The trust beneficiary (Common Schools) will be fairly compensated.

26. SIGNIFICANCE OF POTENTIAL IMPACTS:

Upon review of the project and the analysis herein, I find that none of the project impacts are regarded as severe, enduring, geographically widespread, or frequent. Further, I find that the quantity and quality of the natural resources, including any that may be considered unique or fragile, will not be adversely affected to a significant degree. I find no precedent for the future actions that would cause significant impacts, and I find no conflict with local, State, or federal laws, requirements, or formal plans. In summary, I find that adverse impacts would be avoided, controlled, or mitigated by the design and implementation of the project to an extent that they are not significant.

27. NEED FOR FURTHER ENVIRONMENTAL ANALYSIS:

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

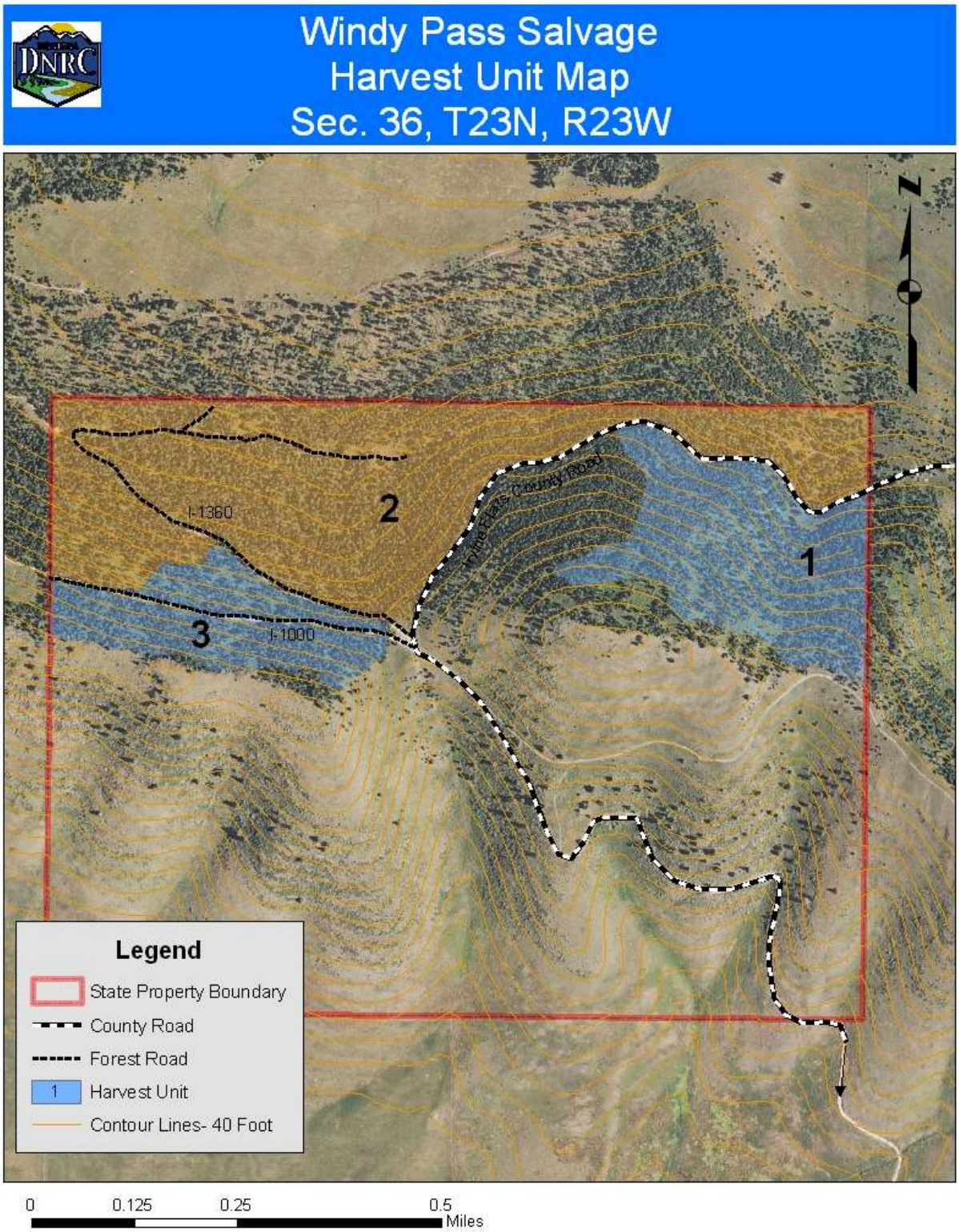
EA Checklist Approved By:	**Name:** Greg Poncin **Title:** Kalispell Unit Manager	
Signature: Greg Poncin	**Date**: 11/5/2012	

ATTACHMENT I – MAPS

Vicinity Map……page 9
Harvest Unit Map……...page 10

Windy Pass Fire Salvage
Vicinity Map
Sec. 36, T23N, R23W

0 1.5 3 6 Miles


Windy Pass Salvage
Harvest Unit Map
Sec. 36, T23N, R23W
N
2
1
3
I-1360
I-1000
Legend
State Property Boundary
County Road
Forest Road
1
Harvest Unit
Contour Lines- 40 Foot
0
0.125
0.25
0.5
Miles

ATTACHMENT II – RESOURCE ANALYSES

- **Vegetation Analysis (pages 12-15)**
- **Wildlife Analysis (pages 16-26)**
- **Soils Analysis (pages 27-31)**

ATTACHMENT II: WINDY PASS VEGETATION ANALYSIS

The vegetation analysis describes the existing conditions in the project area and the anticipated effects of both the no action and action alternatives. Issues expressed during initial public scoping and internal were:

- Dwarf mistletoe in the Douglas-fir and western larch overstory has the potential to infect the younger age classes, reducing timber productivity.
- Timber harvesting has the potential to increase the spread of noxious weeds in the project area.

Analysis Methods

Analysis methods are based on the Montana Administrative Rules of Montana for Forest Management that direct DNRC to promote biodiversity by taking a coarse filter approach thereby favoring an appropriate mix of stand structures and compositions on state lands. Methods used in this analysis include field visits, review of stand level inventory (SLI) data, aerial photography, and review of the White Earth timber sale project file.

Analysis Areas

Direct and Indirect Effects Analysis Area: The Windy Pass project area (Sec. 36, T23N,R23W) was used to assess direct and indirect effects to forest health, timber productivity and noxious weeds.

Cumulative Effects Analysis Area: The DNRC Kalispell Unit was used to assess cumulative effects to forest health, timber productivity, and forest health. This area includes all scattered forested Trust lands parcels administered by the Kalispell Unit for DNRC. This geographic area is a subset of the above Lower Flathead Valley Climatic Section and includes school trust lands in the vicinity of Whitefish, MT south to Arlee, MT and school trust lands in the vicinity of Bigfork, MT west to the Thompson Chain of Lakes.

EXISTING CONDITIONS

Past Management & Stand History:

The stands in the project area were last harvested in 1996 with the White Earth timber sale. The purpose of the sale was to generate revenue for the trust beneficiaries, improve forest health and limit the effects of bark beetles, dwarf mistletoe and overstocked stand conditions.

Most of the stands in the project area were burned in August of 2012, during the West Garceau fire. The fire burned approximately 95 acres in a stand replacement fire regime and 59 acres in a mixed severity fire regime.

Forest Habitat Types, Cover Types, and Desired Future Conditions:

The entire project area is covered by the Douglas-fir series and characterized by warm and dry slopes. The snowberry (Symphoricarpos albus) type is most prevalent.

The current cover type of all forested acres in the project area is ponderosa pine. Although the West Garceau reduced the stocking of live trees in the burned forest stands, the cover type classification of those acres did not change following the fire. The desired future condition for all forest stands in the project area is ponderosa pine.

Timber Productivity:

Insects: Various species of bark beetles have been present in the project area and have generally been at endemic levels. The two species most prevalent have been the mountain pine (Dendroctonus ponderosae) and the pine engraver (Ips pini) bark beetles.

Dwarf Mistletoe: Douglas-fir dwarf mistletoe (Arceuthobium douglasii) and western larch dwarf mistletoe (Arceuthobium laricis) are present in most of the overstory trees that did not burn in the fire. The overstory trees are also infecting the regeneration in the understory as well.

Noxious Weeds: Noxious weed populations are currently found adjacent to the forest roads in the project area. Some populations have spread from adjacent roads into adjacent openings. Weed species identified include: spotted knapweed (Centaurea maculosa) and Houndstongue (Cynoglossum officinale).

VEGETATION EFFECTS

Timber Productivity

No Action Alternative-Direct and Indirect Effects

Timber salvage/sanitation harvesting and post harvest tree planting would not occur. Timber stands burned in the fire would have to rely on natural regeneration to become established. Timber productivity in the project area would be reduced until the new timber stands become established.

Bark beetle infestation in the burned trees would increase the risk of attack and mortality in trees and adjacent stands not burned in the fire.

Dwarf mistletoe affecting the Douglas-fir and western larch would continue and increase spread in both the overstory and understory.

No Action Alternative- Cumulative Effects

Without Silvicultural treatments to reduce losses to insects and disease or initiate new stands, the trend towards slower growing stands dominated by shade tolerant species, as is happening on the Kalispell Unit, would continue.

Action Alternative- Direct and Indirect Effects

Silvicultural treatments would remove both live and dead trees, some of which are infected with insects and disease. Healthy and vigorous trees of all species would be favored for retention where they occur.

Stand health would be improved with the removal of dwarf mistletoe diseased trees. This would result in fewer understory trees being infected.

Removal of fire killed trees would reduce the number of trees susceptible to bark beetle attacks and improve the chances for survival of the remaining live trees.

No change in forest cover type would be expected to occur under the action alternative. However, planting of ponderosa pine seedlings would decrease the time for establishment of regeneration and promote development of the desired forest cover type of ponderosa pine.

Action Alternative- Cumulative Effects

Timber productivity would increase with silvicultural treatments that favor retention of healthy, young trees and removal of trees infected with bark beetles and dwarf mistletoe. Across the Kalispell Unit landscape, the percentage of forested land that is producing timber closer to site potential would increase.

Noxious Weeds

No Action Alternative- Direct and Indirect Effects

Noxious weed seed would continue to spread from existing populations and new populations may be introduced to the project area from uses adjacent to and within state land.

No Action Alternative- Cumulative Effects

Noxious weed populations could increase across the project area and Kalispell Unit as a result of the No Action Alternative. With the adoption of ARM 36.11.445, a more aggressive approach to noxious weed identification and treatment has occurred than in the past. This ongoing treatment of noxious weeds should limit large increases in noxious weed spread and may reduce the number of acres infested in the future.

Action Alternative- Direct and Indirect Effects

Timber salvage/sanitation harvesting and road maintenance would increase the potential for further establishment of noxious weeds with the exposure of bare mineral soil. Applying integrated weed management techniques within the sale design would reduce the occurrence and spread of noxious weeds. Grass seeding road maintenance and log landings and spot spraying new weed infestations would reduce or prevent establishment of additional populations. Washing logging equipment prior to use would limit the introduction of weed seeds into the forest. Trampling of slash in skid trails within the project area would limit the potential for soil disturbance and reduce the potential for weed establishment during and after logging. Treating existing weed populations with herbicide spray would reduce current populations or contain the area infested. A majority of the project area would be winter logged, which would limit the exposure of mineral soil and deter new weed infestations.

Action Alternative- Cumulative Effects

In combination with other management activities on the Kalispell Unit, the Action Alternative would increase the risk of further encroachment of forested sites by noxious weeds. The potential risk would be limited with the use of mitigation measures implemented under the Windy Pass Salvage Project. Actual weed treatments would likely be applied to a more extensive area under the Action Alternative, and have a greater potential for reducing current weed populations within the project area, thereby reducing the noxious weed affected area within the Kalispell Unit.

DNRC, 1996. State Forest Land Management Plan. Montana Department of Natural Resources and Conservation. Missoula, MT

DNRC. 2003. Montana administrative rules for forest management. DNRC. Forest Management Bureau, Missoula, Montana.

Pfister, R.D., B.L. Kovalchik, S.F. Arno, and R.C. Presby. 1977. Forest habitat types of Montana, United States Forest Service., Intermountain Forest and Range Experimental Station, General Technical Report, GTR-INT-34, Ogden, UT.

ATTACHMENT II: 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. The following issue statements were developed from concerns raised by DNRC specialists and public comments received during scoping, and they will be addressed in the following analysis:

- **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.
- **Black-backed woodpeckers.** The proposed activities could disturb birds during the nesting season and reduce black-backed woodpecker habitat suitability by removing snags used for foraging and nesting.

RELEVANT AGREEMENTS, LAWS, PLANS, RULES, AND REGULATIONS

Legal documents dictate management criteria for the management of wildlife and their habitat on state lands. The documents most pertinent to this project include: *DNRC Forest Management Rules*, *DNRC Forested Trust Lands Final Environmental Impact Statement and Habitat Conservation Plan*, the *Endangered Species Act*, the *Migratory Bird Treaty Act*, and the *Bald and Golden Eagle Protection Act*.

ANALYSIS AREAS

The direct and indirect effects of the proposed activities on all species/issues were analyzed within the project area (FIGURE W-1 –ANALYSIS AREAS) which consists of 480 acres of DNRC-managed lands in section 23 T23N, R36W. Cumulative effects were considered within the 9,863-acre West Garceau Fire perimeter.

ANALYSIS METHODS

Analysis methods are based on DNRC State Forest Land Management Rules, which are designed to promote biodiversity. The primary basis for this analysis included information obtained by: field visits, scientific literature consultation, Montana Natural Heritage Program (MNHP) data queries, DNRC Stand Level Inventory (SLI) data analysis, and aerial photograph analysis. The coarse-filter wildlife analysis section includes analyses of the direct and indirect effects of the proposed alternatives on old growth forest, connectivity of mature forest habitats, and snags and coarse woody debris. In the fine-filter analysis, individual species of concern are evaluated. These species include wildlife species federally listed under the Endangered Species Act, species listed as sensitive by DNRC, and species managed as big game by DFWP. Cumulative effects of the proposed activities on all species/issues are discussed at the end of the document.

COARSE-FILTER ANALYSIS

The coarse-filter wildlife analysis discloses the existing conditions of wildlife habitat and the anticipated direct, indirect, and cumulative effects that may result from implementing the No-Action and Action alternatives.

TABLE W-1 –COARSE-FILTER. Analysis of the anticipated effects for coarse-filter resource topics on the DNRC Windy Pass Salvage.

COARSE-FILTER RESOURCE TOPIC	COARSE-FILTER ANALYSIS
Old Growth Forest	Old-growth forest does not occur in the project area, thus no direct, indirect or cumulative effects would be anticipated.
Connectivity of Mature Forest Habitat	The proposed harvest would occur in burned timber stands containing small 1-5 acre patches of mature canopy cover. The proposed harvest would focus on removing dead and dying timber, but would also remove some green timber, primarily Douglas-fir in the understory of ponderosa pine. However, considering the small patch size of green timber within the matrix of burned forest, the area is not likely to provide mature forested habitat for wildlife. Thus, negligible adverse direct, indirect or cumulative effects on species sensitive to removal of mature forest cover would be anticipated.
Snags and Coarse Woody Debris	***Detailed Analysis Provided Below*** – The proposed activities could affect the availability of snags and coarse-woody debris.

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. Habitat value of snags for wildlife varies according to tree species, diameter, and snag density. Thick-barked species (e.g., 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.

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. Single, scattered downed trees may provide access under the snow for small mammals and weasels, while log piles may provide secure areas for species such as snowshoe hares. Timber harvest may affect the abundance and spatial distribution of snags and coarse woody debris by direct removal for commercial value or for human safety purposes, or indirectly by increasing human access for firewood harvesting.

Analysis Area

The analysis area for direct and indirect effects is the 480-acre project area (FIGURE W-1 –ANALYSIS AREAS).

Analysis Methods

The abundance of snags was estimated in the project area during visits to the site. 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

The project area (480 total acres) consists of approximately 188 acres (39.2% of project area) of timber stands burned by the West Garceau Fire of 2012. The remaining acres consist of grasslands. During field visits, 10-20 snags/acre ≥8 inches dbh were observed within the burned area proposed for harvest. Species composition of these snags consists of ponderosa pine and Douglas-fir snags with a few western larch snags. Birds were observed foraging on these snags, but new nest cavities were not observed. Coarse woody debris levels varied across the project area, but on average were 0-10 tons/acre within burned timber stands. Coarse-woody debris will likely increase in this area over time as snags fall. Firewood harvesting risk is high due to the high density of open roads in the project area. Open road density in the project area is 3.5 miles/square mile and the density of open and restricted roads combined is 4.8 miles/square mile.

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 or 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

The majority of merchantable burned trees and snags would be removed from 156 acres (32.5%) of the 480-acre project area due to timber felling operations. Additional recruitment trees and snags may also be lost following timber harvest due to wind throw. 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 2 large snags and 2 large recruitment tree (>21 inches dbh) per acre would be retained in the harvest unit (*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 Forest Management Rules (*ARM 26.11.414*) and would likely increase post-harvest. No roads are proposed for construction and accessibility to the area for firewood cutting would not change. Thus, since: 1) the proposed action would remove the majority of existing merchantable snags and burned trees from 156 acres (32.5% of project area), 2) accessibility for firewood harvesting would not change, and 3) snags and coarse woody debris would be retained in amounts required to meet DNRC Forest Management 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.

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. 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-2 –FINE-FILTER provides an analysis of the anticipated effects for each species. Cumulative effects on all species are discussed at the end of the document.

TABLE W-2 –FINE-FILTER. Analysis of the anticipated effects for fine-filter species on the DNRC Windy Pass Salvage Timber Sale.

SPECIES/HABITAT	FINE FILTER ANALYSIS
THREATENED & ENDANGERED SPECIES	
Canada lynx (*Felis lynx*) Habitat: Subalpine fir habitat types, dense sapling, old forest, deep snow zones	No Canada lynx habitat occurs within the project area. Thus, no adverse direct, indirect, or cumulative effects to Canada lynx would be anticipated.
Grizzly bear (*Ursus arctos*) Habitat: Recovery areas, security from human activity	The project area is located outside of grizzly bear recovery and non-recovery occupied habitat (*USFWS 1993, Wittinger 2002*) and use of the project are by grizzly bears is unlikely. Thus, no adverse direct, indirect, or cumulative effects affects to grizzly bears would be anticipated.
SENSITIVE SPECIES	
Bald eagles (*Haliaeetus leucocephalus*) Habitat: Late-successional forest less than 1 mile from open water	The proposed activities would not occur within 1 mile of open water. Loon Lake, the closest body of water to the project area, is located approximately 7 miles northeast of the project area and has no history of use by nesting bald eagles. Thus, no direct, indirect, or cumulative effects to bald eagles would be anticipated.
Black-backed woodpeckers (*Picoides arcticus*) Habitat: Mature to old burned or beetle-infested forest	***Detailed Analysis Provided Below*** – Approximately 480 acres of forested burned in the West Garceau Fire occur within the project area.
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	Grassland habitat occurs in the vicinity of the project area, however, Columbian sharp-tailed grouse have not been observed within 10 miles of the area (*MNHP data, 2012*). Thus, no direct, indirect, or cumulative effects to Columbian sharp-tailed grouse would be anticipated.

Common loons (*Gavia immer*) Habitat: Cold mountain lakes, nest in emergent vegetation	No suitable lake habitat occurs within 1 mile of 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	The proposed activities would not occur in suitable fisher habitat, additionally the surrounding area consists primarily of grasslands interspersed with stands of timber and the area is unlikely to provide suitable fisher habitat. Thus, no adverse direct, indirect, or cumulative effects to fisher would be anticipated.
Flammulated owls (*Otus flammeolus*) Habitat: Late-successional ponderosa pine and Douglas-fir forest	The project area contains preferred flammulated owl cover types; however these stands were burned in the West Garceau Fire and are not currently providing suitable habitat structure for flammulated owls. Thus, no direct, indirect or cumulative effects to flammulated owls would be anticipated.
Gray wolves (*Canis lupus*) Habitat: Ample big game populations, security from human activities	No wolf packs are located near the project area and no known den or rendezvous sites exist within 1 mile of the project area (*K. Laudon, DFWP, wolf management specialist, pers. comm., October 1, 2012*). Thus, no direct, indirect or cumulative effects to gray wolves would be anticipated.
Harlequin ducks (*Histrionicus histrionicus*) Habitat: White-water streams, boulder and cobble substrates	No suitable high-gradient stream habitat occurs within 0.5 miles of the project area. Thus, no direct, indirect or cumulative effects to harlequin ducks would be anticipated.
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 for nest sites were observed during field tours of the area or within 0.5 miles of the project area. Additionally, peregrine eyries have not been documented within 0.5 miles of the project area (*MNHP data, 2012*). 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	The project area does not contain suitable pileated woodpecker habitat due to the West Garceau Fire. Thus, no direct, indirect, or cumulative effects to pileated woodpeckers would be anticipated as a result of either alternative.
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 would be expected to occur as a result of either alternative.
BIG GAME	

Elk (*Cervus canadensis*)	The project area is situated in an area that consists primarily of grasslands and is not likely to provide suitable big game winter range that would ameliorate severe winter conditions, due to the lack of canopy cover in the area. The proposed harvest would focus primarily on removing dead and dying trees that do not provide thermal cover for big game, thus, no adverse direct, indirect or cumulative effects to big game are anticipated.
Mule Deer (*Odocoileus hemionus*)	
White-tailed Deer (*Odocoileus virginianus*)	

BLACK-BACKED WOODPECKER

Issue: *The proposed activities could reduce black-backed woodpecker habitat suitability by removing snags used for foraging and nesting and disturb birds during the nesting season.*

Introduction

Black-backed woodpeckers are a medium-sized woodpecker known to specialize in forests having undergone recent disturbance, such as wildfire or extensive insect outbreaks. Black-backed woodpeckers feed almost exclusively on wood-boring insects and bark beetles. Immediately after a moderate or stand-replacement wildfire, black-backed woodpecker numbers increase up to four years post-fire (usually peaking 2-3 years post-fire) and then decrease in subsequent years (*Bull et al. 1986, Murphy and Lehnhausen 1998, Dixon and Saab 2000*). Black-backed woodpeckers favor areas of higher snag densities for both nesting and foraging. Snags species preferred for nesting are western larch, ponderosa pine, Douglas-fir, and lodgepole pine, usually 9 to 16 inches dbh (*Harris 1982*). Nests are typically active from late April through early July. Past research suggests that postfire salvage-logged forest patches contain lower black-backed woodpecker densities than comparable, unlogged burned forest (*Caton 1996, Hitchcox 1996, Hutto and Gallo 2006, Schwab et al. 2006, Koivula and Schmiegelow 2007, Saab et al. 2009*). Salvage logging can affect characteristics of standing snags (i.e., species composition, diameter, spatial distribution, and density) on the landscape, which may reduce habitat suitability for black-backed woodpeckers.

Analysis Area

The analysis area for direct and indirect effects is the 480-acre project area (FIGURE W-1 –ANALYSIS AREAS).

Analysis Methods

Analysis methods include field evaluations, aerial photograph interpretation, and Geographical Information System (GIS) analysis of available habitat. GIS analysis of the fire boundaries was used to identify preferred black-backed woodpecker habitat greater than 40 acres in size (*ARM 36.11.438*). Factors considered in the analysis include: 1) the degree of harvesting, 2) the suitability of black-backed woodpecker habitat.

Existing Conditions

Black-backed Woodpeckers

The project area consists of 188 acres (39.2%) of forested stands and 292 acres (60.8%) of grassland burned in the West Garceau Fire, which occurred in the summer of 2012. The species composition of the burned timber stands consists primarily of ponderosa pine and Douglas-fir and the burn severity is

mixed with some small pockets of low severity fire throughout the project area. The intensity of the fire and the species composition are suitable for black-backed woodpecker use. Additionally, a black-backed woodpecker was observed in the project area during a field visit in September 2012. Approximately 10-20 snags >9 inches dbh occur in this area and the percentage of live mature canopy cover ranges is on average 0-20%, although this percentage will likely decline over time due to continued tree mortality expected for several years following the fire (DNRC 2011:19-22).

Environmental Effects

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

None of the proposed forest management activities would occur. Thus, since: 1) no changes to black-backed woodpecker habitat suitability would occur, and 2) no disturbance during the nesting season would occur, no direct or indirect effects to black-backed woodpeckers associated with habitat suitability or disturbance during the nesting season would be anticipated as a result of the No-Action Alternative.

Direct and Indirect Effects of the Action Alternative on Black-backed Woodpeckers

The proposed activities would affect 156 acres (83.0%) of the 188 acres of burned timber stands present in the project area. The proposed harvest would remove the majority of merchantable existing snags and burned trees, reducing the snag density and the suitability of the area for black-backed woodpeckers. However, across the project area, at least 2 large snags and 2 large recruitment tree (>21 inches dbh) per acre would be retained (*ARM 36.11.411*). The remaining contiguous 32 acres of DNRC-managed burned timber stands would not be harvested, which would continue to provide some potential black-backed woodpecker habitat (*ARM 36.11.438(1)(b)*). Mechanized activities would be minimized from April 15- July 1 to reduce disturbance to nesting black-backed woodpeckers. If present in the vicinity of the project area, black-backed woodpeckers could be displaced for up to 8 months by the proposed activities. Thus, since: 1) snag density would be reduced on 156 acres (83.0%) of potential black-backed woodpecker habitat, but snags would be retained according to *ARM 36.11.411* and *ARM 26.11.414*; 2) mechanized activities would be prohibited from April 15 – July 1 to reduce disturbance to nesting birds; 3) the proposed activities would occur for a short 8-month time period; and 4) a contiguous patch of 32 acres of DNRC-managed burned timber stands would not be harvested; minor adverse direct and indirect effects to black-backed woodpeckers associated with habitat suitability or disturbance during the nesting season would be anticipated as a result of the Action Alternative.

CUMULATIVE EFFECTS ON ALL SPECIES/ISSUES

Cumulative effects analyses account for known past and current activities, as well as planned future agency actions. Recent and ongoing projects in the 9,683-acre cumulative effects analysis area that could contribute to cumulative effects include:

- DNRC 1996 White Earth Timber Sale – Harvest of 0.5 MBF within the project area and surrounding sections.

Changes to forest structure resulting from the project have been accounted for in SLI data used for this analysis.

Analysis Area

The 9,683-acre cumulative effects analysis area (FIGURE W-1 –ANALYSIS AREAS) consists of the area burned in the West Garceau Fire of 2012 and incorporates burned timber stands most likely to be affected by salvage logging, as well as areas that could be used by local black-backed woodpeckers. This scale includes sufficient area to support multiple pairs of black-backed woodpeckers.

Existing Conditions

The cumulative effects analysis area contains approximately 2,496 acres of timber stands burned in the West Garceau Fire, which occurred in the summer of 2012. The remaining 7,187acres consist of burned grasslands. DNRC manages 477 acres (4.9%) of the burned area, the Salish and Kootenai Tribes manage 2,114 acres (21.0%), and the remaining 7,092 acres (74.1%) are privately owned. The species composition consists primarily of ponderosa pine and Douglas-fir, but snag density and burn severity varies across the analysis area. Coarse woody debris levels also varied across the project area, but on average were 5-10 tons/acre in the area affected by the fire. Coarse-woody debris will likely increase in this area over time as snags fall. Open road density in the project area is 1.4 miles/square mile and the density of open and restricted roads combined is 1.5 miles/square mile, facilitating access for firewood cutting.

Environmental Effects

Cumulative Effects of the No-Action Alternative on Snags, Coarse-woody Debris, and Black-backed Woodpeckers

None of the proposed forest management activities would occur. Ongoing and proposed forest management projects on other ownerships within the cumulative effects analysis area could adversely affect black-backed woodpeckers and snag and coarse-woody debris availability. Thus, since: 1) no changes to snag or coarse-woody debris availability would occur, 2) no changes to access or firewood cutting risk would occur, and 3) no disturbance to black-backed woodpeckers would occur, no cumulative effects to snags and coarse woody debris availability, or black-backed woodpecker habitat quality or disturbance risk would be anticipated as a result of the No-Action Alternative.

Cumulative Effects of the Action Alternative on Snags, Coarse-woody Debris, and Black-backed Woodpeckers

The proposed activities could adversely affect black-backed woodpeckers and snag and coarse-woody debris availability. The proposed activities would remove the majority of snags as well as some live timber that may provide wildlife habitat on 156 acres (6.3%) of burned timber stands available in the cumulative effects analysis area. However, 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 2 large snags and 2 large recruitment tree (>21 inches dbh) per acre would be retained in the harvest unit (*ARM 36.11.411*). No roads are proposed for construction and accessibility to the area for firewood cutting would not change. Black-backed woodpeckers could be displaced by forest management activities for up to 8 months; however mechanized activities would be minimized from April 15 - July 1 to reduce disturbance to breeding black-backed woodpeckers. Snag and coarse woody-debris and black-backed woodpecker habitat could be affected by salvage projects occurring on other ownerships; however, DNRC is unaware of any such projects at this time. Thus, since: 1) snag density would be reduced on 156 acres (6.3%) of timber stands burned in the West Garceau Fire, but snags and

coarse-woody debris would be retained according to *ARM 36.11.411* and *ARM 26.11.414*; 2) accessibility for firewood harvesting would not change; 3) mechanized activities would be minimized from April 15 – July 1 to reduce disturbance to nesting birds; and 4) a contiguous patch of 32 acres of DNRC-managed burned timber stands would not be harvested; and 5) the proposed activities would occur for a short 8-month time period; minor adverse cumulative effects to snags and coarse woody debris availability and black-backed woodpecker habitat quality or disturbance risk would be anticipated as a result of the Action Alternative.

LIST OF MITIGATIONS

- 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*).
- Minimize mechanized activity within 0.25 miles of burned forested stands in the project area between April 15- July 1st to minimize disturbance to black-backed woodpeckers.
- Close any road or skid trails opened with proposed activities minimize the potential for unauthorized motor vehicle use.
- Manage for snags, snag recruits, and coarse woody debris, particularly favoring western larch and Douglas-fir (*ARM 36.11.411, ARM 26.11.414)*.

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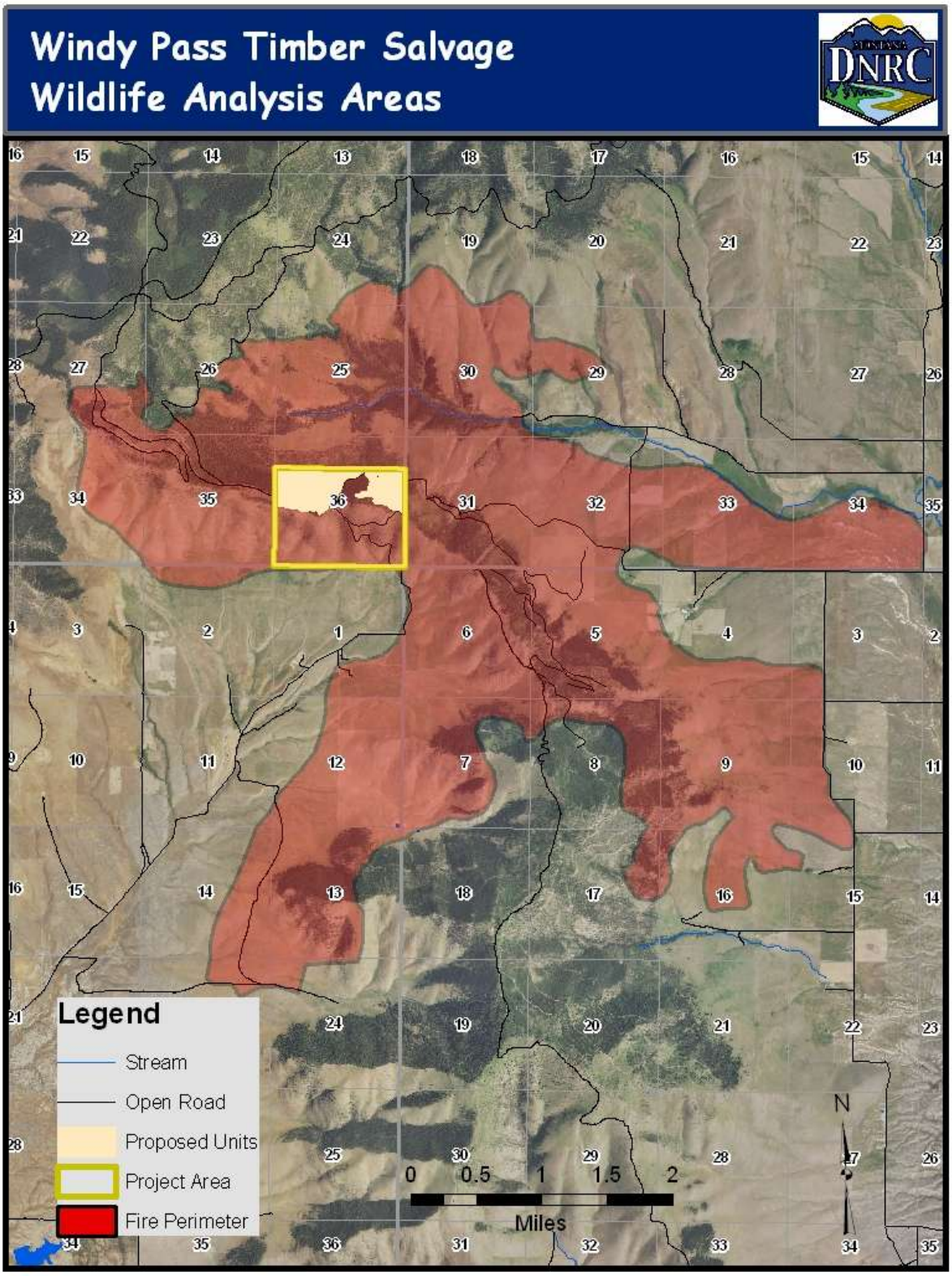
FIGURE W-1 –ANALYSIS AREAS. Wildlife analysis areas for the proposed DNRC Windy Pass Timber Salvage.



ATTACHMENT II: SOILS ANALYSIS

INTRODUCTION

This analysis is designed to disclose the existing condition of the soil resources and present the anticipated effects that may result from each alternative of this proposal. During the public scoping, no issues regarding soil impacts were identified by the public. Internally within DNRC, issue statements were developed to measure application of Forest Management Rule criteria. The following issue statements were compiled from internal discussions regarding the effects of the proposed timber harvesting:

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

- *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.*

- *Increased erosion and deposition of surface soils may result following forest fires. Removal of surface vegetation and duff create bare soil. High intensity fire can create water-repellent soils in areas which can lead to further increased risk of erosion.*

The project area for this proposal includes approximately 480 acres. Because harvesting is proposed on just a portion of the project area, the analysis area will be smaller.

REGULATORY DOCUMENTS and PAST FOREST MANAGEMENT

The project area is covered by the Forest Management Rules section of the Administrative Rules of Montana. The Forest Management Rules were generally derived from recommendations in the State Forest Land Management Plan (DNRC 1996). In addition, the project area is included in the recent Habitat Conservation Plan adopted by the Montana Board of Land Commissioners.

DNRC strives to maintain soil productivity by limiting cumulative soil impacts to 15 percent or less of a harvest area, as noted in the SFLMP (*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.

Cumulative effects from past and current forest management in the proposed harvest units are as a result of skid trails and landings. Records show evidence of harvest dating as early as the 1950's. The most recent harvest activity took place in the mid-1990s. Impact from skid trails and landings from this time period have been reduced through freeze-thaw cycles and root mass penetrating the soil. While a portion of the impacts have ameliorated over time, skid trails are still visible in the proposed harvest units. These skid trails are spaced approximately 75 feet apart based on pace transects and do not appear to be eroding more than the surrounding un-trailed areas, but reduced tree densities and vigor is present on these areas. A list of harvesting in the project area can be found in the project file.

Nutrient Cycling

Coarse and fine woody debris provide a crucial component in forested environments through nutrient cycling, microbial habitat, moisture retention and protection from mineral soil erosion. (Harmon et al 1986). While coarse woody debris decays at various rates due to local climatic conditions, the advanced stages of decay contains many nutrients and holds substantial amounts of moisture for vegetation during dry periods (Larson et al. 1978, Wicklow et al. 1973). Forest management can affect the volumes of fine and coarse woody debris through timber harvesting and result in changes to the available nutrients for long term forest production. The method for quantifying the coarse woody debris is described in the *Handbook for Inventorying Downed Woody Material* (Brown, 1974)***DESCRIPTION OF ALTERNATIVES***

- *No-Action Alternative*

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

- *Action Alternative*

  Three units totaling approximately 157 acres are proposed for commercial fire salvage under this alternative. All of the proposed salvage would be trees killed during the Garceau fire in summer of 2012. All units would be harvested using conventional ground-based equipment. Approximate miles of road activities include:

  - 5.6 miles would be maintained or have drainage improvements installed as necessary to protect water quality.
  - No new or reconstructed road is proposed with this project.

Recommended Mitigation Measures and Contract Clauses

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, 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 in order 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 would agree to a 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 unless impacts can be adequately mitigated. Regardless of use, these trails 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 displacement or erosion. Based on site review, short, steep slopes may require a combination of mitigation measures, such as adverse skidding to a ridge or winchline, and 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 on the steeper slopes.

6) Retain 12 to 24 tons of large woody debris (depending on habitat type) and a feasible majority of all fine litter 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.

Issue Statement	Analysis Methods & Analysis Area	Existing Condition	Direct, Indirect an
			No Action Alternative
Ground based harvest techniques can displace and compact soils which can adversely affect the hydrologic function, soil structure and long-term productivity of the impacted area.	Methods for disclosing impacts include using general soil descriptions and the management limitations for each soil type. 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. (DNRC, 2011). The analysis area will be the proposed harvest units and road locations.	None of the soil types in the analysis are considered to be highly erosive. Erosion factors are in the moderate range. Transects in previously entered stands found skid trail and ATV trails to impact 8 to 14 percent of the area. Impacts from past timber harvest projects on similar soils has resulted in average impacts of 13.1 percent (range of 3.0 to 26.2 percent).	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.
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.	Coarse woody material will be addressed qualitatively through ocular estimates conducted during field reconnaissance. These observations will be compared with scientific literature as required by ARM 36.11.414 (2). If the action alternative is selected, this assessment will assist in developing contract requirements and mitigation measures necessary to ensure post project levels of CWD adequately meet the recommendations of relevant literature, primarily Graham et al (1994). Fine woody material will be addressed solely through contract language that minimize removal (ARM 36.11.410). The analysis area will be the proposed harvest units.	The West Garceau fire burned with moderate to high intensity through the proposed salvage units. This left the coarse woody debris component very low to nonexistent through most of the proposed units. Recommended levels for habitat types in the proposed harvest units are estimated at 12 to 24 tons per acre.	No changes to coarse woody material would result from this alternative. Coarse woody debris levels and nutrient cycling would continue as dictated by natural events.

Issue Statement	Analysis Methods & Analysis Area	Existing Condition	Direct, Indirect an
			No Action Alternative
Increased erosion and deposition of surface soils may result following forest fires. Removal of surface vegetation and duff create bare soil. High intensity fire can create water-repellent soils in areas which can lead to further increased risk of erosion.	Water repellent (hydrophobic) soil conditions were determined by identifying areas with highest burn intensity. These areas were tested with water to determine whether water was beading and rolling off or soaking in. Extent of area with duff and ground vegetation burned off was determined using ocular estimates during field reconnaissance.	No areas of hydrophobic soils were identified within any of the proposed units. In areas of highest burn intensity, all areas tested allowed water to infiltrate with no beading or shedding. Approximately 90% of the proposed salvage units had all duff and ground vegetation burned off during the fire. No active erosion was observed at the time of field review.	No changes to soil erosion risk are expected with this alternative. Hydrophobic soils, duff and vegetation levels are not expected to change with this alternative. Vegetation will begin to re-colonize burned sites as dictated by natural and pre-existing conditions.

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ATTACHMENT III- SILVICULTURAL PRESCRIPTIONS

Sale Name: Windy Pass Salvage Unit Number(s): 1

Location – Section 36 TWP: 23N RGE: 23W

Elevation: 4,000 **Slope:** 30% **Aspect:** N, NW

Habitat Type: PSME/SYAL **Acres:** 39

Current Cover Type: PP **Potential Vegetation:** PP

Soils: Mitten- Very gravelly silt loam; Finleypoint-Wildgen gravelly loams

Water: N/A

Description of existing stand: The unit consists of 120 year old Douglas-fir and ponderosa pine and western larch. The unit was burned during the West Garceau fire in August 2012. Before the fire, there were approximately 125 trees per acre averaging 11 inches dbh. The harvest unit experienced a mixed severity burn and approximately 40% of the overstory was killed in the fire. The fire burned in stand replacement intensity along the west edge and top of the unit. The remainder of the unit experienced a ground fire with single and group tree torching. Much of the understory vegetation was burned or severely scorched in the fire.

Treatment Objectives:

1. Salvage trees killed in the fire.
2. Sanitize Unit by removing trees infected with dwarf mistletoe.
3. Retain 1 snag and 1 snag recruit greater than 21" per acre.
4. Protect soil productivity.
5. Reduce competition for PP and WL in densely stocked patches of timber.

Prescribed Treatment: Salvage/Sanitation

Harvest method: The unit will be ground-based harvested using existing roads and skid trails. An excavated skid trail above the county road would need to be constructed and closed after harvest. The harvest should salvage fire killed and damaged trees. Lightly scorched trees, especially PP & WL, should be retained. Retain at minimum 1 snag and 1 snag recruit greater than 21" per acre. In unburned areas, cut all trees infected with dwarf mistletoe, showing signs of bark beetle activity, and DF or other species that may be crowding a WL or PP.

Hazard Reduction: Minor slash concentrations at landings will be piled. Otherwise, hazard reduction was accomplished by the fire.
Site Preparation: None prescribed. Ground fire scarified much of the unit.

Regeneration: Spot plant approximately 11 acres with 2,500 ponderosa pine seedlings on a 14 x 14 spacing.

Anticipated Future Treatments: Treat seedlings with bloodmeal starting fall 2014; 2014-2019- Monitor success of planted regeneration.

Sale Name: Windy Pass Fire Salvage Unit Number(s): 2

Location – Section 36 TWP: 23N RGE: 23W

Elevation: 3,900 **Slope:** 25% **Aspect:** N, NE, NW

Habitat Type: PSME/SYAL **Acres:** 93

Current Cover Type: PP **Potential Vegetation:** PP

Soils: Finleypoint- Wildgen gravelly loams; Courville-gravelly silt loams

Water: N/A

Description of existing stand: The unit consisted of 120 year old ponderosa pine, Douglas-fir, and western larch. The unit was burned in the West Garceau fire in August 2012. Before the fire, there were approximately 60 trees per acre averaging 14" dbh. The harvest unit experienced a stand replacement burn with most of the overstory trees killed in the fire. The understory vegetation was largely consumed in the fire as well.

Treatment Objectives:

1. Salvage trees killed in the fire.
2. Retain 2 snags greater than 21".
3. Protect soil productivity.

Prescribed Treatment: Salvage/Sanitation

Harvest method: The unit will be ground-based harvested using existing roads and skid trails. The harvest should salvage trees killed in the fire. Retain 2 snags per acre greater than 21".

Hazard Reduction: Minor slash concentrations at landings will be piled. Otherwise, hazard reduction was accomplished by the fire.

Site Preparation: None prescribed. Ground fire scarified unit.

Regeneration: Plant 80 acres with ponderosa pine seedlings on 14'x14' spacing; Total seedlings to be planted: 17,760.

Anticipated Future Treatments: Treat seedlings with bloodmeal starting fall 2014; 2014-2019- Monitor success of planted regeneration.

Sale Name: Windy Pass Salvage Unit Number(s): 3

Location – Section 36 TWP: 23N RGE: 23W

Elevation: 4,100 **Slope:** 35% **Aspect:** N, NE

Habitat Type: PSME/SYAL **Acres:** 24

Current Cover Type: PP **Potential Vegetation:** PP

Soils: Mitten- very gravelly silt loams; Courville-gravelly silt loams

Water: N/A

Description of existing stand: The unit consists of 120 year old Douglas-fir and ponderosa pine and western larch. The unit was burned during the West Garceau fire in August 2012. Before the fire, there were approximately 120 trees per acre averaging 11 inches dbh. The harvest unit experienced a mixed severity burn and approximately 25% of the overstory was killed in the fire. The fire burned in stand replacement intensity along the west edge of the unit, generally between the I-1000 & I-1360 roads. The stand above the existing I-1000 road experienced minor spot fires and were only scorched with a few scattered mortality. Dwarf mistletoe is present in most of the Douglas-fir overstory and minor amounts in the western larch overstory.

Treatment Objectives:

1. Salvage trees killed in the fire.
2. Sanitize unit by removing trees infected with dwarf mistletoe.
3. Retain 1 snag and 1 snag recruit greater than 21".
4. Protect soil productivity.
5. Reduce competition for PP in densely stocked patches of timber.

Prescribed Treatment: Salvage/Sanitation

Harvest method: The unit will be ground-based harvested, except for a small area along the eastern boundary that is too steep. This area should be hand-felled and trees winched to existing roads. An excavated skid trail above the I-1100 road will be needed to skid logs

to landing. The harvest should salvage fire killed and damaged trees. Lightly scorched trees, especially PP & WL, should be retained. Retain at minimum 1 snag and 1 snag recruit greater than 21" per acre. In unburned areas, cut all trees infected with dwarf mistletoe, showing signs of bark beetle activity, and DF or other species that may be crowding a WL or PP.

Hazard Reduction: Minor slash concentrations at landings will be piled. Otherwise, hazard reduction was accomplished by the fire.

Site Preparation: None prescribed. Fire did a good job of scarification.

Regeneration: Spot plant approximately 11 acres with 2,500 ponderosa pine seedlings on a 14 x 14 spacing.

Anticipated Future Treatments: Treat seedlings with bloodmeal starting fall 2014; 2014-2019- Monitor success of planted regeneration.

ATTACHMENT IV – MITIGATIONS

Mitigation measures for the Action Alternative:

Vegetation

- Remove trees infected with bark beetles and mistletoe to improve forest health.
- All equipment used in road construction and timber harvesting operations will be cleaned of plant parts, dirt, and weed seeds prior to entry to prevent the possibility of seed dispersal by equipment.
- Grass seed cuts and fills associated with new road construction and areas disturbed during reconstruction.
- Monitor project area and contract herbicide spraying as needed to control spot outbreaks of noxious weeds.

Soils & Water Resources

- Limit equipment operations to periods when soils are relatively dry, (less than 20 percent), frozen, or snow-covered to in order to minimize soil compaction and rutting, and maintain drainage features.
- On ground-based units, the logger and sale administrator would agree to a 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 unless impacts can be adequately mitigated. Regardless of use, these trails may be closed with additional drainage installed, where needed, or grass-seeded to stabilize the site and control erosion.
- Tractor skidding should be limited to slopes of less than 40 percent unless the operation can be completed without causing excessive displacement or erosion. Based on site review, short, steep slopes may require a combination of mitigation measures, such as adverse skidding to a ridge or winchline, and skidding from more moderate slopes of less than 40 percent.
- Keep skid trails to 20 percent or less of the harvest unit acreage. Provide for drainage in skid trails and roads concurrently with operations.
- 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 on the steeper slopes.

- Retain 12 to 24 tons of large woody debris (depending on habitat type) and a feasible majority of all fine litter 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.

Wildlife

- 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*).
- Minimize mechanized activity within 0.25 miles of burned forested stands in the project area between April 15- July 1st to minimize disturbance to black-backed woodpeckers.
- Close any road or skid trails opened with proposed activities minimize the potential for unauthorized motor vehicle use.
- Manage for snags, snag recruits, and coarse woody debris, particularly favoring western larch and Douglas-fir (*ARM 36.11.411, ARM 26.11.414)*.

Air Quality

- Slash burning will be conducted only when weather and air quality conditions are favorable for smoke dispersion and as allowed under the cooperative Montana/Idaho Airshed Group rules and regulations.

ATTACHMENT V – LIST OF PREPARERS & CONSULTANTS

List of Preparers

Brent Kallander – Project Leader, Trust Lands Management Forester, DNRC Kalispell Unit

Leah Breidinger – Wildlife Biologist, DNRC Northwestern Land Office

Tony Nelson – Hydrologist, DNRC Northwestern Land Office

List of Consultants

Ross Baty- Wildlife Biologist, Forest Management Bureau, Missoula

Jim Bower- Fisheries Program Specialist, Forest Management Bureau, Missoula

Gary Frank- Resource Management Supervisor, Forest Management Bureau, Missoula

Amy Helena- MEPA Coordinator, Forest Management Bureau, Missoula

Patrick Rennie- Archaeologist, Ag & Grazing Bureau, Helena

Jeff Schmalenberg- Soil Scientist, Forest Management Bureau, Missoula

Tim Spoelma- Silviculturist, Forest Management Bureau, Missoula